THE

AMERICAN JOURNAL OF PHARMACY.

SEPTEMBER, 1853.

ON THE PROGRESS OF PHARMACY IN GREAT BRITAIN.

Our last number made the readers of the Journal acquainted with the Act of Parliament, familiarly known in England by the name of the "Pharmacy Act," by which certain powers were granted to the Pharmaceutical Society of Great Britain to regulate the qualification of its members, and to assume a name or title not hitherto generally applied, which should imply a special qualification in Pharmacy. We now propose to give a short account of the circumstances out of which this measure has grown, and the agencies by which it was accomplished.

The Parliament of Great Britain is the supreme power of the land, the power to which all classes appeal to remedy great evils, and whose mandates are universally respected. To obtain an Act of Parliament, where the powers asked for have a bearing on several classes of the community, requires great perseverance and influence on the part of its promoters, as the Bill is subjected to the severest scrutiny both by the legislative bodies, and the parties who will be influenced or imagine they will be affected injuriously by it.

In the year 1843, soon after the origin of the Pharmaceutical Society, the Council made application and obtained a Charter, which granted the Society certain corporate privileges, and publically acknowledged the chemists and druggists as a distinct class of the community, yet gave them no restrictive power in regulating the qualification of the practitioners of pharmacy. From that time to the granting of the Act just obtained, the Society have anxiously sought to obtain additional powers. In 1846 a bill was drafted and discussed by the Council, but little progress was made until after the election of Jacob Bell to Parliament. The first aim of the Council was to obtain an Act clothing the Society with authority sufficiently ample to compel all future "chemists and druggists"

to undergo an examination, and thus obtain a license to practice before opening stores. They also sought powers as an examining body, agreeing in that case to abandon the educational functions which the Society had voluntarily performed from its commencement, leaving the candidates at liberty to obtain the requisite knowledge where they pleased, provided they were able to pass the examinations in chemistry, materia medica, pharmacy and toxicology. A Bill was introduced by a motion of Mr. Bell, on the 12th of June, 1851, and read for the first time June 13th. On the second of July Mr. Bell moved a second reading, and supported the motion by a speech, embracing an historical account of the circumstances which attended the rise and progress of the body asking for the Act, going back to the early difficulties with the apothecaries before the Charter in 1815, and showing that the object of the bill was not to create a monopoly, or to interfere with the parties at present engaged in business, or with any of the medical corporations, but was intended to improve the qualification of the practitioners of Pharmacy, and thus eventually raise the status of the whole pharmaceutical profession.

Several objections arose on the part of members not conversant with the object of the bill, in reference to the extent of power delegated to the Society; whilst others, among whom was Mr. Wakley of the *Lancet*, advocated it, when it was suffered to be again read, on condition that final action should not be pressed at that Session.

It was soon found in its progress before the House of Commons, that opposition would be made from various sources to the bill as introduced, and that the powers aimed at, and the privileges conferred, would have to be greatly curtailed. The druggists and chemists of Edinburgh held a meeting to consider the bill, and required that, so far as Scotland was concerned, the Examining Board should be appointed by members of the Pharmaceutical Society resident in Scotland. At another meeting held at Aberdeen, the chemists and druggists agreed in this suggestion, and expressed a "desire that Scotland might participate in the benefits of the Bill." The Liverpool chemists suspecting that "an infringement of their privileges was contemplated," opened a correspondence with Mr. Bell, and appointed a committee to watch the progress of the measure. A member of

the House, Mr. Lacy, attempted to impede its passage by offering a motion, that it be made the law of the land, that all medicines vended by apothecaries and druggists for external use, and all poisonous liquids, like laudanum, for either external or internal use, be sold only in square or polygonal-sided bottles, whilst internal medicines, not poisons, should be vended in round or oval bottles. The proposition to insert this clause called out the action of the Council of the Society, who opposed it as injudicious and destructive of its own object. Some of the strongest opposition to the bill arose from the idea that the chemists and druggists were aiming secretly at medical practice, so as to conflict with apothecaries or general practitioners; whilst, on the other hand, opposition was manifested by members of Parliament, on the ground that the bill was striking at free trade in drugs and medicines by creating a trading monopoly. The Royal College of Surgeons of Glasgow, and the Faculty of Physicians and Surgeons of Edinburgh, sent petitions opposed to the bill, on the ground of interference with their rights of licensing in Scotland, and asking Parliament to confer the same licensing power, asked for in the bill, on their bodies, that they might individually examine the chemists and druggists in Scotland.

On the 12th of February, 1852, Mr. Bell again moved the consideration of a Pharmacy Bill, which he stated was similar to the one brought forward at the last session, with some alterations to meet the objections of some of its opponents, which was read, and its second reading fixed for the 25th of February. A change of Ministry having occurred, the second reading was postponed till March 17th, when Mr. Bell presented petitions from the Royal Colleges of Physicians and Surgeons in its favor, and a petition signed by 150 eminent medical practitioners in London, and numerous others over the country. He then stated the merits of the bill as then proposed, explained the clauses on which doubts were offered, and finally moved its second reading, which, after some opposition, was agreed to, and the bill referred to a select committee, consisting of Jacob Bell, chairman, Mr. Ewart, Mr. Bouverie, Sir William Gibson Craig, Sir Henry Willoughby, Mr. Wakley, Mr. Deedes, Mr. Hindley, Mr. Jackson, Mr. Farrar, Mr. Wyld, and Lord Burghley.

This committee met on the 30th of March, on the 2d, 22d, 26th,

27th, and 29th of April, and on the 7th and 12th of May, to examine witnesses, and on these occasions examined thirty witnesses, among whom were some of the most distinguished physicians, surgeons, apothecaries and pharmaceutists of Scotland and England, and also Prof. Kopp, of Strasburgh, and Dr. Hamburg, of Stockholm. The printed minutes of evidence taken by the committee cover 210 folio pages, embracing more than 2850 questions and answers. The distinguished character of the parties concerned, the fair and dispassionate manner in which the examination was conducted, and the great variety of facts (statistical and others) and opinions which it elicited, render this parliamentary document a valuable addition to the historic literature of British pharmacy. The committee reported on the 21st of May, and the report was ordered to be printed.

We give below a few extracts from the evidence of several of the witnesses:

The mass of testimony is so great, and the witnesses so numerous, that in the small space we can allot to the extracts, but a few detached passages can be given, yet they will be sufficient to exhibit the aims and spirit of the parties under examination:

James Arthur Wilson, M. D., Senior Physician to St. George's Hospital.

"7. Do you consider that it is as necessary for the person who compounds the prescription to be educated in pharmacy, as it is for the physician to be educated in the practice of medicine, and the surgeon in surgery?—To refuse assent to that proposition would be to deny physic altogether. I cannot fancy a greater satire on physic than by declaring that the means we employ were of little or no consequence.

"8 Then you consider it may be laid down as an axiom, that pharmaceutical chemists ought to be examined by some Board before they undertake to compound the prescriptions of medical men?—Certainly; they should be proved competent.

"52. Would you, as a physician desirous that your patients should be protected from ignorant persons compounding your prescriptions, feel that there was a security conferred upon you in that respect by the power that the [Pharmaceutical] Society is applying for? I should feel it a very great comfort, and a very great relief to my conscience, if I knew that that Society educated and examined men for pharmaceutical chemists. I and every physician must feel humiliation, more or less, in knowing that our prescriptions are left on the table, and go out, it may be, to where the butler or the lady's maid has a friend around the corner.

"143. I understand you to say that you are not in the habit of recommending your patients to take your prescriptions to any particular dispensing chemist?—Never.

"144. But would you feel the same delicacy in recommending your patients to take a prescription to a member of the Pharmaceutical Society?—If every chemist was a member, I should say "take it anywhere; you are safe."

"145. But if they were not all members, would you feel any delicacy in

recommending them to take it to such a member of the profession, because all you want is to secure its being compounded by a person of education and competence?—There might be a person in the next street who was a chemist by instinct, by taste, who might be equally competent with a member of the Pharmaceutial Society, and I should feel a delicacy certainly in interfering.

"146. Would you feel less delicacy in saying to your patients, 'Take my prescription to one who is a member of the Pharmaceutical Society,' than you would in interfering now?—Certainly.

"175. There is another point to which I will call your attention with respect to the effect of the Pharmaceutical Society, assuming it to exist with the privileges as stated; would it have any effect upon the other branches of the profession in this way;—would it by any possibility, induce chemists to become practitioners in their own houses?—I believe they would become less and less practitioners over the counter, as it is called. They are practitioners now to a great extent in many instances, and very reprehensible the practice is; and by none, I believe, is it more deprecated than by the leading members of the Pharmaceutical Society. But I believe if their status was raised as pharmaceutical chemists, if they were recognized under an Act of Parliament as a scientific body, with a real chartered and Parliamentary existence, they would be less inclined to meddle with the practice of Physic, to tamper with what they know but little or nothing about."

"176. In fact, it would secure a division of labor?—I believe so, though not entirely; because if a groom, for example, had swallowed 'boot-top stuff' or 'stuff for cleaning saddles,' by mistake, and then his friend rushed into the chemist's shop and said, 'Give me an antidote for oxalic acid,' how could it be possible to refuse it? or how would it be possible, on Saturday night if a farmer's man asked for a good strong dose of physic to take the next morning, to refuse that?

"177. Then, in point of fact, you consider that, more or less, it is inevitable that the chemists and druggists should practice physic?—To that extent inevitable."

John F. South Esq., President of the Royal College of Surgeons, &c.

"202. Do you think that a division of labor is desirable in the profession?—Certainly.

"203. And that advantage would arise from a body being recognized by law as representing the department of pharmacy?—Certainly.

"204. Do you think that, by that means, discoveries in pharmacy and improvements in preparations would be more to be expected, than would be the case if the persons practising pharmacy were also medical practitioners?—Yes, because such persons would be able to give more time to it than medical practitioners usually have the opportunity of doing.

"206. Do you consider that the state of the Law in reference to pharmaceutical chemists is satisfactory at the present time, seeing that any person, whether he is a tinker, or a footman, or a coachman, whatever he may be, if he can get money enough to start a little shop, can assume the title of pharmaceutical chemist?—Certainly not.

"207. Do you think it the duty of the Legislature, in cases affecting life and health, to have a supervision over matters of that description?—Yes, I do.

"208. Have you heard of the proceedings which have been taken by the chemists during the last 11 years, with the view of raising their qualifications and becoming an educated body?—Yes, I have.

"209. Do you generally approve of those proceedings?—Yes, very sincerely; very fully.

"210. Do you think it desirable, fair, and proper that the chemists should have the management and examination of their body?—I think so."

Mr. John Savory, Pharmaceutist, of Bond street, London.

"471. Do you think that the fact of knowing that no examination is required, causes apprentices to pay very little attention to the study of their business?—I am quite sure of it; I have had pretty well thirty years experience, and from all I can learn, the want of an examination in this country for pharmaciens, or for chemists and druggists, is the cause of young men, during their apprenticeship, paying little or no attention to their business.

"472. Supposing an apprentice were desirous of informing himself respecting his business, was there before the establishment of the Pharmaceutical Society any definite course of instruction?—None whatever till the establishment of the Pharmaceutical Society.

"474. Do you find any difficulty in obtaining competent assistants?—I find the greatest difficulty in obtaining them.

"475. Have you frequently had occasion to examine 20 or 30 when you wanted one, before you found one that was fully qualified for his business?—I have lately been in want of two assistants, and I have had 40 or 50 applicants, and out of those I found very few who were acquainted with the rudiments of pharmacy or chemistry; they could hardly read a Latin prescription; that is to say, if it was anything out of the common way. I never take a young man into my house without his passing an examination; it is by no means a severe one. I put prescriptions before them, and if they cannot read those Latin prescriptions, of course I consider at once that they are not qualified to come into my house. I do not, however, rest satisfied with that. I ask them upon articles in those prescriptions. As, for instance, I believe in one of them there is muriate of soda; I say, 'Pray, can you tell me what is muriate of soda?' The reply is 'It is muriate of soda.' But what is it; can you tell me any thing about it; what is its present chemical name? 'Muriate of soda,' that is all that I can get out of them."

Sir Benjamin Brodie, Bart.

"718. Do you consider that division of labor in the profession is desirable; and that there should be a class of persons devoting their almost exclusive attention to chemistry, and the manufacture of medical substances?—Not only desirable but very important.

"721. Do you think that that class of persons ought to pass an examination?—It seems very desirable that they should.

"763. A doctor of medicine is examined previously to obtaining his diploma; and a surgeon is examined previously; why should not a chemist be examined previously?—Exactly; and I think that those examinations would be more useful in fact than the examinations of medical practitioners, because the candidates cannot be crammed for them; whereas candidates get crammed for medical examinations to a very great extent, especially for those of the Apothecaries company."

[Sir. Benj. Brodie gave strong testimony in favor of the Pharmaceutical Society, and advised that they should have power to enact their own by-laws, subject to the revision of the Secretary of State.]

Mr. Peter Squire, Pharmaceutist, of Oxford St., London.

"784. At the time you were educated in business was there any regular method of educating pharmaceutical chemists and druggists?—They were regularly apprenticed and premiums given; and it was necessary that they should have served seven years apprenticeship at that time.

"785. But was there any recognized method of teaching them Chemistry, Pharmacy, Materia Medica, and so on?—None whatever; they picked up what they could by becoming at first mere scrubs, and then elevating themselves from being mere scrubs by becoming assistants.

"787. Where they instructed in the theory of chemistry?—Not in the least.

"788. If a young man had devoted much of his attention to chemistry and

botany, would he have been cautioned against neglecting his business?—Yes; I acquired my knowledge of botany chiefly on Sundays. I had no theoretical instruction but what I got myself from books.

"795. Are there a great number of persons who call themselves chemists without possessing the least education whatever in chemistry and pharmacy? I should think that that is a lamentable fact.

"796. Have you been induced to support the Pharmaceutical Society with a view of raising the standard of qualification of chemists and thus benefiting the public?—Entirely with that view.

"797. You have been an examiner, I think?—I have, from the first establishment of the Society.

"800. Do you think there has been an improvement in qualification since the Pharmaceutical Society was formed?—I think a very great improvement.

"809. Can you state the nature of the examination?—The nature of the examination is simply this: a young man is called upon to read prescriptions, with their terminations, and not in short dog Latin. They are also called upon to translate these prescriptions, and to translate them not only literally but in an elegant manner. They are then asked if they know the nature of each of the ingredients in the prescriptions, and to give a reason why such and such things should be put together, and what chemical decompositions take place in the different admixtures; in short to form a judgment on the prescription as to whether it is a chemical or unchemical one, in order that they may be able to give a hint to medical men hereafter, if they are not up to chemistry, that they may set themselves right in future. I think that very necessary, because I have frequently found that medical men were not so well versed in pharmacy and chemistry as our body; and I think that those hints are very valuable to medical men, and by those means one profession assists the other. Then we examine them upon materia medica, and the knowledge of the quality and action of the drugs. They are called upon to state what part of a plant they have before them; to what natural order it belongs; what are its uses in medicine and what are its particular properties. They are not examined beyond stating what the doses of those medicines are. They are also examined chemically as to the chemistry of the pharmacopœia. They are examined also upon toxicology and botany; and I think when I have said that I have stated all our examination.

"810. By whom are the examiners appointed?—The examiners are appointed by the Council.

"811. How many examiners are there?—Eight I believe."

Mr Thomas Herring, wholesale druggist, London.

"824. You have been many years a wholesale druggist?—I have been in business about 43 years.

"826. Does your business bring you in communication with the chemists and druggists throughout the kingdom?—It brings me in contact with the chemists in London and in the provinces; and in Scotland and in Ireland; I have visited them and know them personally.

"829. Do you consider from what you know of the body of chemists and druggists that they are properly qualified for their business?—Not generally; a very great deal of mischief arises from want of knowledge; for instance, take any gentleman who is a qualified person, and knows his business, and he would not buy any thing but what is of proper quality; but a great many of those who purchase drugs are men not educated, by which means a vast quantity of medicines are sold of an inferior quality.

"831. Are those persons competent to judge of the quality of the drugs which you sell?—Certainly not; and moreover, when they order an article which is poison or a medicine of stringency, not knowing the Latin name, require the English name also.

"833. Does that occasion the circulation in the market of a great many drugs of so inferior a quality, that they would not be received by any educated chemist?—Yes; those who do not know the quality of drugs, are sure to be imposed upon, because the most common drugs bear the best profits.

"840. Do you think that the ignorance of so many persons, who call themselves chemists, causes the circulation of larger quantities of inferior drugs than otherwise would take place?—I do. If a man is educated we should not show him the inferior drugs, which a person who does not know the article would select in preference, on account of the low price.

"852. Is it your practice to buy these adulterated drugs?—We do not buy them largely; we are compelled to supply an article of that kind when ordered. A customer comes in and asks for Scammony at a low price; this article [showing a specimen] is produced and he buys it, but we do not keep it in stock; but a man who was educated at all, would see himself that it was impure.

"853. You are obliged to yield to the demand for such drugs as are asked for by your customers?—We are forced to keep them, but we never use them in preparations.

"857. Have you found more difficulty in satisfying your customers since the establishment of the Pharmaceutical Society; have they paid more attention to the quality of the drugs?—Yes, it has been quite a stimulus to all them who have joined the Society.

"862. Is it your opinion that it is desirable to prohibit the sale of drugs by persons not druggists?—That is my idea: I have thought for a considerable length of time that Government ought to appoint a man to look after the drugs; there ought to be a man who understands his business to go round to the different shops and investigate the drugs. You see what a great improvement has taken place with respect to the importation of drugs into the United States of America; if an article is imported there now, the moment the vessels have landed the packages, they pull them open if there is any suspicion of their being bad, and if they are bad they are seized; consequently the trade dare not send a bad article to America now; it would be seized.

"865. Is the medical inspector attached to the Custom-house?—The medical inspector is attached to the custom house, and no medicines are landed without he sees them."

Mr. George Walter Smith, Secretary of the Pharmaceutical Society.

"935. You have been for many years in the drug business?—For upwards of 30 years, both wholsale and retail, in town and country.

"936. You were connected with the Pharmaceutical Society at the time of its formation?—I was.

"944. But was the primary object of the Society education?—Yes; to educate and qualify the body so as to render them efficient servants of the public.

"949. Do you remember the number of members who joined during the first year?—I have a statement here of the numbers in the several years. [This is extracted from a table exhibiting also the number of persons who left, and who were admitted into the Society during the several years indicated, but which is omitted.]

Years.	Members.	Associates and Apprentices.	Years.	Members.	Associates and Apprentices.
1841	668	266	1847	1678	1159
1842	1658	2313	1848	1634	1013
1843	1640	2079	1849	1561	865
1844	1574	1706	1850	1550	814
1845	1691	1475	1851	1485	735
1846	1673	1436			

"975. Was it found absolutely requisite to establish a model school of pharmacy to indicate the course of study that young men ought to go through?—It was necessary not only to institute a system of education, but in the hope of bringing forward educated men to become teachers.

"976. In the establishment of this school, has every thing been done which the experience in other countries, and the teachers in this country, could suggest, to make the education as complete as possible?—I apprehend so. We have established lectures in chemistry, materia medica, pharmacy and botany; and we have established a laboratory which is well attended.

"977. Have you a statement of the number of pupils who have attended?—Yes; the number of pupils who have attended the laboratory are here stated, [with the receipts and expenses during several years.]

Years.	Pupils.	Fees received.	Professors' fee.	Drugs, chemicals and apparatus.	Fuel, Gas & Coke	Coal,	Total Expenditures.
1844–45	10	$1638.00	$ 519.00	$ 891.00	$191.00		$1951.00
1845–46	27	2016.00	1008.00	1056.00	250.00		2621.00
1846–47	27	2226.00	1113.00	1207.00	345.00		2715.00
1847–48	27	2349.00	1174.50	978.00	201.00		3212.00
1848–49	31	2515.00	1257.37	1023.00	175.00		2826.00
1849–50	28	2648.00	1324.25	1185.00	215.00		3091.00
1850–51	37	3497.00	1698.37	1289.00	251.00		3605.00
Total,	187	$16,889.00	$8,394.49	$7,629.00	$1628.00		$20,021.00

"979. Have you the number of pupils who have attended the lectures?—Yes, this is the statement [as condensed from the original.]

Subjects.	Professors,	1842	1843	1844	1845	1846	1847	1848	1849	1850	1851
Botany,*	Dr. A. T. Thomson, F.L.S.	42	30	65	62	75	73	55	42	48	44
Chemistry,	George Fownes, F. R. S.	71	66	49	47	48	—	—	—	—	—
Organic Chemistry,	" " "	—	—	—	59	45	33	—	—	—	—
Materia Medica,	Dr. J. Pereira, F. R. S.	78	44	49	56	46	46	37	44	44	88
Pharmacy,	Theophilus Redwood.	78	57	49	54	47	—	—	—	—	—
Chemistry & Pharmacy,†	" "	—	—	—	—	—	54	46	42	47	85

"984. Have you a statement of the total expenditure of the Society?—I have, both of the receipts and expenditure in round numbers.

Receipts and Expenditures of the Pharmaceutical Society of Great Britain from the 1st of June, 1841, to the 31st of December, 1852.

Subscriptions,	$177,975	Investments,	$44,050
Donations,	14,540	Printing and delivery of journals,	49,130
Entrance fees,	3,755	Lectures and other educational purposes,	59,155
Lecture and Laboratory fees,	22,160	Library, Museum and apparatus,	10,795
Interest of money,	9,315	Charter, arms, and certificate of membership,	4,685
Balance,	2,010	Examiners,	270
	$229,755	Officers and servants,	24,785
		Rent, rates and taxes,	18,325
		Office sundries,	12,900
			$224,275

"1054. Does your Society propose to grant a certificate of qualification without a fee?—No; that I apprehend will be arranged in the bill.

* Dr. Bentley assumed the Chair of Botany on Dr. Thomson's death in 1849.

† Mr. Redwood lectured on both Chemistry and Pharmacy after Mr. Fownes' death.

"1065. Do you know what fee they propose to charge for the certificate of qualification?—There will be three examinations, and the total will be about 10 guineas ($52.50.)

"1066. Then it would be necessary for a young man who wished to assume the title of 'Pharmaceutical Chemist,' according to your present notion, to pay 10 guineas?—Yes, for three examinations.

"1067. He could not be registered without paying that?—Not under the Bill.

"1069. Do you know how many chemists and druggists there are throughout the kingdom?—About 5000, and 5000 assistants.

"1092. Of course you have held communications, as the Secretary of the Society, with the chemists and druggists throughout England?—I have.

"1093. Have you found that the standard of education has been much improved since the establishment of the Pharmaceutical Society?—Yes, I have the evidence of that around me, in the young men who attend the lectures, and receive the instruction of the laboratory.

"1094. Do you know anything of the history of chemistry at the present moment?—I consider it to be very much on the advance with regard to our own body, not only in the education which we give in the institution, but in the inquiry and application exhibited by the young men in the country, who, anticipating an examination, are preparing themselves by careful study during their apprenticeship."

[To be continued.]

In the course of the evidence taken before the committee, it soon became evident that the exclusive powers at first sought by the Society could not be obtained, and that the bill, even in its altered condition, would not pass the House without a further curtailment of the powers granted. The bill was altered, so that instead of the penalty applying to the *act of unqualified persons carrying on the business of chemist and druggist*, it was rendered applicable only to the *assumption of the title of "pharmaceutical chemist," or "pharmaceutist," by unqualified persons;* or to the false declaration of membership in the Society. The plan of general registration was abandoned, and the registration applied only to members of the Pharmaceutical Society, and such other chemists and druggists as may submit to an examination by the Examining Board appointed by the Council. In fact, from being "a measure providing for the registration of all chemists and druggists, and the examination of all who may in future assume a name or title, &c., implying qualification in Pharmacy, it was reduced to an act for confirming and amending the charter of incorporation, and conferring an honorary distinction on the members of the Society." Instead of compelling qualification in *all*, it merely *requires* qualification of those who may choose to adopt the title, thus leaving it optional with dispensers of medicine, whether they adopt the title or not. In this modified form (see

page 312 of this volume) as presented by the committee, the Act passed the House, and subsequently became the law of the land.

Opinions being variable among the members of the Society as to the advantages likely to arise from the Act, it was determined at a meeting of the Council, held on the 19th of July, 1852, to call a special General Meeting, for the 4th of August, "to discuss the provisions and operation of the Pharmacy Act, and to consider the steps which it may be expedient to take in reference to it."

In accordance with the call, the meeting was held. Mr. Edwards, of Dartford, moved, "That in order to bring the Pharmacy Act into more extensive and immediate operation, it is desirable that the Pharmaceutical Society should include among its members all duly qualified dispensing Chemists throughout the United Kingdom." The resolution was carried unanimously.

Mr. Orridge moved, "That this meeting recommends the Council to adopt a liberal construtiion of the terms of the Act in regard to the admission of Chemists in business on their own account before the passing of the Act," which was carried unanimously.

Mr. Morson moved, "That the Pharmacy Act having been passed for the purpose of elevating the character and status of the Pharmaceutical Chemists of Great Britain by means of improved education, this meeting considers it of the highest importance that the Members of the Society should afford every encouragement and facility to their Assistants and Apprentices for preparing themselves to pass the examination," which was also carried unanimously.

Mr. Bell received a vote of thanks, for his "energetic exertions in promoting the passing of the Pharmacy Act through Parliament."

Having obtained the Act, partial as it was in its powers, the next step was to decide on the plan for carrying it into effect so as to accomplish the best results. Among the numerous members of the Pharmaceutical Society, scattered over England and Scotland, men of all grades of liberality and ability exist, and it was not to be expected that a measure affecting the interests of the whole profession should pass into a law without being met by opposition, often frivolous, sometimes serious. Perhaps there is no country where the persons who retail drugs and dispense medicines

—taking all grades—include such various degrees of qualification, from the two-penny grocer to the scientific chemist. As a class, however, the very nature of their business has given them a favorable *prestige* in public opinion. This is manifest by the numerous instances where responsible public service is required of chemists and druggists; yet a large number of inferior practitioners exist, who reflect no credit, but cast, rather, a shadow on the profession. Abundant testimony was given in to the Committee of Parliament, proving that a decided improvement had taken place in the cities and larger towns in the general manner of conducting business since the establishment of the Society, and the circulation of its Journal. The example of the few has, by a kind of catalytic action, infused ideas of reform among the many—the motives often not higher than competition. A better understanding is growing up with the medical profession, who, seeing the disposition of the better class of members to refrain from medical practice in accordance with the rules of the Society, encourage them in their endeavors after a better education. The old jealousy among chemists is disappearing, and union of effort for mutual aid gradually taking its place.

According to the terms of the Act its provisions were to go into effect a year from the date of its passage. As this period approached, the chemists and druggists, not members, everywhere exhibited signs of interest in regard to the influence of the Act. To meet this interest, and to induce as many as possible of the better class of chemists and druggists, not members, to join the Society, and thus swell its influence, two by-laws were passed by the Council, and adopted at a special general meeting held Dec. 8th, 1852, which gave those members of the profession who commenced business between the date of the Charter (1843) and the Pharmacy Act, (June, 1852,) liberty of admission without examination, but by certificates of qualification, signed by six members, and all *associates* of date prior to June, 1852, the same privilege.

To facilitate the communication of provincial members with the parent Society, it had long been usual to communicate through Local Secretaries, who often held but a semi-official position. The importance of a more methodical arrangement of the Local Secretaries attracted attention, and it was designed to have such an official agent in every town, in communication with the General Secretary.

For several months previous to March, 1853, a committee of Council was engaged in preparing a set of by-laws to carry out the provisions of the Pharmacy Act. This duty called for the wisest judgment of the Council, to so work the by-laws that the Act might be rendered most effectual. As the by-laws had to be adopted at the general meeting in May, before their approval by the Chancellor of the Exchecquer, Lord Palmerston, their construction became extremely important, involving, as chief points, "to fix the rate of subscription and the amount of fees; to define the duties of the officers of the Society; to regulate the examinations; the times and manner of holding the meetings," &c., so as not to conflict with either the Charter or the Act. In the discussion of the by-laws none excited more interest and feeling than that relating to the payment of registration fees. As soon as it was understood that the standing of pharmaceutists was to be established by a registration, the idea of making it supercede membership occurred, and was urged as an oversight in the framers of the Act, which could be taken advantage of by all who desired to avoid the annual contribution. Among those who took this view, Mr. Bastick and Mr. Dickinson, editors of the *Annals of Pharmacy*, were the most prominent, and in the columns of their journal openly encouraged disaffection, declaring themselves to be the advocates of a numerous class of country members. These gentlemen appear to have been mistaken in their views, as the charter grants the Society liberty to regulate its acts by by-laws. In the by-laws it is made optional with the applicant for registration whether he pays the fuel fee and is placed on the perpetual register, or by paying an annual fee, is put on the annual register.

In accordance with previous notice, a stated general meeting of the Society was called for the 11th of May, to consider and confirm the by-laws as elaborated by the Council, preliminary to their being submitted to the Secretary of State. When the proposition to read them by sections was made, it was negatived, and decided to consider them as a whole. After being read, it was moved that "the by-laws now read be approved and confirmed as the by-laws of the Pharmaceutical Society." After much discussion of certain clauses, and various motions put and lost, the original motion of Mr. Hooper was carried *nem. con.*

The by-laws thus approved were forwarded to the Secretary of

State for his approval. Meanwile, the few persons who had constituted themselves a secret committee to oppose the by-laws, having utterly failed to make any impression in the special general meeting, the only legitimate tribunal for such an appeal to be made, so far lost sight of their duty as members, where the majority should rule, as to make a special appeal to Lord Palmerston (who then had the by-laws under consideration) against them, thus bringing the disrepute of internal disagreement on the Society. In consequence of this want of unanimity, Lord Palmerston, who had received the by-laws as approved by the Society, on the 11th of May, informed Mr. Bell that, in consequence of the opposition to the by-laws, indicating a disagreement among the members, he would require more time to consider them, and requested a written statement in support of the views of the Council. A memorial was duly sent, signed by the president, vice president, and nineteen out of twenty members of the Council, when, on the 17th day of June, the Secretary of State returned the by-laws duly confirmed according to the Act.

Such is a succinct history of this great movement, from its origin to the accomplishment of its object, so far as gaining recognition as an educated body by Parliament was concerned. The real process, however, is but just begun. English Pharmacy has gone into its *pupa* state; the *chrysalis* of the future pharmaceutical body of Great Britain is now in process; years of quiet, undemonstrative progress will have to be gone through by the mass, until it has acquired that form and those elements which will fit it for bursting forth from the cocoon in which ignorance and long usage have enveloped it, that it may expand into the beautiful proportions and assume the extended powers with which science will have endowed it. W. P., Jr.

DECOLORIZING PROPERTY OF THE ESSENTIAL OILS.

By John L. Plummer, M. D., Richmond, Ind.

On recently opening a bottle of oil of lemons, I was surprised to find the inner third of the cork whitened, as if by the action of nitric acid. I could account for this appearance only on the supposition that the cork had previously been exposed to that acid; or that the oil was a factitious compound generated by the action

of nitric acid on some other substances, and still retaining acid enough to affect the cork.

On boiling some of the whitened portion of the cork in distilled water, and adding solution of sulphindigotic acid, the blue color was quickly discharged. I tested for chlorine, but no indications of its presence appeared.

Although there seemed to be sufficient evidence of the existence of NO_5 in the boiled liquid, I could not but hesitate before I adopted this conclusion, especially as I observed, while cutting the cork, that it retained nearly its original elasticity or toughness. I found also that the oil readily bleached the blue solution, and at the same time exhibited no acid reaction with blue litmus paper. The conclusion appeared unavoidable, that the essential oil discharged the color from both the cork and the indigo solution.

Here a new inquiry was opened to me. Was this bleaching property possessed by essential oils generally? I subjected the sulphindigotic acid solution to the action of twenty-two volatile oils. With the exception of two, *they all completely discharged the color of the indigo*. The oils tried were:

Ol. Limonis,	Ol. Tanaceti,	Ol. Bergamii,	Ol. Sabinæ,
Fœniculi,	Piperitæ.,	Cari,	Hedeomæ,
Juniperi,	Rorismarini,	Lavendulæ,	Gaultheriæ,
Terebinthinæ,	Chenopodii,	Caryophylli,	Sassafras,
Anisi,	Cinnamomi,	Origani,	

and that of fir and of hemlock.

Of these the oils of winter-green and sassafras produced the least impression on the $AnO_2\ SO_3$,* but even they ultimately discharged the color; all the rest speedily dissipated the blue, so as to leave the liquid limpid and colorless as water. The oils of tansy turpentine, juniper, lemons, fir, hemlock, and peppermint, were among the most active. Two or three drops of the oil of tansy, quickly bleached a test-tube full of the blue reagent. This, like most of the oils, discharged the color without the aid of heat, simple agitation for less than quarter of a minute being sufficient. Some of the more obstinate would bleach little more than equal parts of the colored liquid, and then only by the assistance of heat. The oils in some cases became somewhat milky after agitation with the

[*This formula for sulph indigotic acid represents it as sulphate of the deutoxide of Anyle; Anyle=An=$C_{16}H_5N$.—Editor.]

AnO_2 SO_3, and remained so; other oils remained perfectly transparent from the beginning.

It will be perceived that both classes of oils, those containing no oxygen and those into which that element enters as a constituent, are enumerated among the bleaching agents. As commercial oil of turpentine is more or less oxygenated, I attempted to introduce pure camphene into the blue solution. Into a small retort I poured about half a drachm of very limpid spirits of turpentine, with twenty or more times the quantity of distilled water. The retort was then exposed to the vapor of boiling water in one of the small holes of the Beindorf's apparatus, and the neck introduced into a test-tube containing the blue liquid, so far as to close the mouth of the tube. The extremity of the neck of the retort scarcely reached the surface of the blue liquid. In a few minutes, without any perceptible distillation, the blue liquid became as colorless as water, the vapor of camphene having apparently been absorbed by the fluid in the test-tube. Citrene, obtained in like manner, acted as the camphene did.

Balsam of copaiva, without heat, changed the color of its own bulk of sulphindigotic acid in solution to a mere shade of greenish blue. The active principle in this case was probably the volatile oil of copaiva.

A *drying* oil was now tried. Linseed oil in the proportion of about eight parts to one of AnO_2+SO_3, caused the blue color to abate, and by agitation and heat the depth of color was still further diminished, but the blue tinge was not wholly dissipated until the next day, when every vestige of color was removed. The oil appeared like yolk of egg.

Glycerine (a few drops to the test-tube one-third full) instantly disappeared in the blue solution, and reduced it to a very pale greenish-blue color.

Camphor, boiled several minutes in the indigo solution, made no perceptible change in its color.

Tincture of camphor, shaken with the blue liquid, converted the blue to a greenish hue. The blue liquid diluted to the same extent by water or alcohol retained its blue tint. After two days standing without change, both camphorated mixtures were placed a few hours in the sun: the result was, the liquid in both tubes became completely bleached.

It appears to me that this reaction of the oils upon $AnO_2\ SO_3$, may be profitably appropriated in Pharmacy. For example: *Oil of Savine is liable to be adulterated.* I find on testing it with $AnO_2\ SO_3$, that the blue color is not discharged except by a large quantity of the oil; and to effect the bleaching quickly, heat is required; and further, that the oil remains clear.

On the other hand, the oils of juniper, fir, and hemlock, (the articles most likely to be chosen to adulterate the oil of savine,) bleach a very large proportion of the blue liquid. It is done quickly, heat is not required, and the oils become milky.

Black and White Mustard.

Sinapis nigra yielding a volatile oil belonging to the third class, and Sinapis alba, according to our authors, furnishing no essential oil, it became an interesting question to know what effect the two species of seeds would produce upon $An_2\ SO_3$.

One scruple each of sound black and white mustard seed was triturated to the same degree of fineness, and emptied into equal portions (test tubes nearly full) of the blue solution. Both portions of the liquid were instantly affected. The contents of the tubes were shaken together, and then filtered. The filtrate of the black mustard mixture was of a very pale *yellowish-green* color; that of the white mustard of a very pale *pea-green* color. These

[In reflecting on the curious results detailed by Dr. Plummer, it has occurred to us that probably the bleaching power was due to *ozone*. Faraday has stated (Lecture at Royal Inst., noticed in Lond. Med. Gaz., June 20th, 1851, and copied into Amer. Jour. of Pharm., vol. xxiv, p. 74,) that "Essential Oils are thickened by long exposure to light and air; they become *ozonized*, and their properties changed. This was illustrated by reference to oil of turpentine. Freshly rectified and pure oil of turpentine was proved by admixture with sulphate of indigo to have no bleaching power. A small quantity of oil which had been exposed to air and light, (in a bottle half full,) destroyed the color in a few minutes like chlorine." It is probable that the oils tried by Dr. P. were those in the shop bottle. Could not the air in the test tube, in the experiment with camphine vapor, have become ozonized, and this acting powerfully as stated on the sulph-indigotic solution? The facilitating influence of the sun's rays in the camphor experiments is an additional reason in favor of this supposition. We have not had time to compare experimentally the results of Dr. Plummer with the views of Faraday, but have thought best to throw out the suggestion.—Editor Am. Journ. Pharm.]

filtrates were treated with another portion of the powdered seeds, agitated and again filtered. In these filtrates scarcely a vestige of any color remained.

TINCTURA CINCHONÆ FERRATA.

By Samuel Simes.

Huxham's Tincture, the officinal Compound Tincture of Peruvian Bark, cannot be combined with any of the ordinary chalybeates without an offensive decomposition, seriously affecting its apparent, if not its real characteristics. These reactions were examined at the solicitation of Dr. J. F. Meigs, and a tincture prepared, so modified that it is no longer incompatible with the salts of iron. Sixteen grains of Ammonio Citrate of Iron are dissolved in each fluid ounce of this modified tincture, together constituting what has been denominated, for distinction, "Ferrated Tincture of Bark."

It is readily prepared by digesting in the Edinburgh Compound Tincture of Cinchona, sufficient hydrated sesquioxide of iron to completely eliminate the cincho-tannin, whether pure, oxidized, or combined. One ounce of hydrated sesquioxide, dried at a temperature not exceeding 130° Fahr., usually suffices for one gallon of the tincture. After filtration, the tannate and excess of oxide should be washed with boiling alcohol to remove any trace of alkaloid which may have been in combination with the tannin and precipitated with it. This alcoholic solution may be evaporated to dryness, the product dissolved in a little water acidulated with citric acid, and added to the filtrate along with the proper quantity of iron salt. It differs little in appearance from the ordinary Huxham's tincture, is exceedingly agreeable, and in teaspoonful doses has become a very energetic invigorative, admirably adapted for administration in those cases of weak and languid habits of children and females, where the body is in a pallid or flaccid state, and very susceptible of fatigue or morbid action.

The ferrated tincture is not solely dependent on the quinia and iron it contains for its value as a curative agent. The grateful, and by no means inefficient adjuvants, the orange peel and snake root, and the other proximate principles of cinchona, independant of quinia, are by no means to be overlooked, and cannot be

replaced by salts of quinia and iron alone, however scientific their artificial combinations may appear.

Fine French brandy, employed as the menstruum, yields a still more grateful preparation, and should be substituted in all cases for the diluted alcohol, when the additional expense is no obstacle.

A quantitative examination of the cinchona alkaloids contained in this tincture, both before and after the elimination of the tannin, was made without appreciable difference in the results. A portion of the tincture as I have supplied it having been delivered to Prof. Booth to determine its iron constituent with accuracy, elicited the following statement:

PHILADELPHIA, Aug. 3d, 1853.

DEAR SIR:—The Ferrated Tincture of Bark, which you submitted to me for analysis, yields 4.23 grains of sesquioxide of iron to the fluid ounce.

Respectfully yours,

JAS. C. BOOTH.

MR. SAMUEL SIMES, Philadelphia.

The sesquioxide in 100 grains of the ammonio-citrate of iron was accurately determined to be 25.84 grains, consequently 4.23 grains of sesquioxide correspond with 16.37 grains of ammonio-citrate in each fluid ounce of the tincture examined. The slight discrepancy is probably due to some difference in graduated measures.

PHARMACY IN GERMANY.

GÖTTINGEN, [GERMANY,] July 12th, 1853.

ESTEEMED FRIEND:—It is with much pleasure that I sit down to answer your queries in regard to the state of Pharmacy and Pharmaceutical Education in Germany; and as my object has been to obtain true and substantial information, I have called to my assistance Prof. Wiggers, Professor of Pharmacy and Materia Medica in this University, and Inspector (appointed by the Government) of the *Apotheke* of the Kingdom of Hanover, to whom I am thankful for many of the ideas contained in these answers.

1st. The *schema* of pharmaceutical education does not differ much in the different States of Germany; in Austria only is the system not so scientifically conducted.

2d. The actual amount of shop practice is seven years. After serving four to five years as an apprentice, and then making an examination before the Judicial Physician of the District, the candidate is admitted to the rank of Assistant, which rank he must have fulfilled three years before he can present himself as candidate to the last State Examination. During his term of apprenticeship, he is only allowed to prepare prescriptions, under the immediate superintendence of an assistant.

3d. The *Schools of Practical Pharmacy* are in a great degree different from the apothecary's shop, only those operations being performed that do not often occur in the common operations of the apothecary, or such that serve to increase the practical knowledge of the student. A large portion of the time is taken up in chemical analysis, (principally qualitative,) this branch of study being neglected in the shop practice, or rarely taught in the *Apotheke*. Such service in these laboratories does not pass in lieu of the shop practice. In some of the German countries the studying at the University, or at Pharmaceutical Institutions, is not *obligatory* before a candidate can present himself for examination, though the high standard required at the examination in most cases renders it necessary for the student of pharmacy to spend two to three terms at the University or such institution. In Prussia the law compels the candidate to spend a certain amount of time at the University or Institute.

4th. In regard to the *actual* extent and degree of the inspection of the stock of the druggist, I have the following to communicate, this being the manner of conducting it in Hanover: 1. The persons employed and all books belonging to the business are revised, and if any deficiencies are found they are entered in the *protocol*. 2. The shop, store room and laboratory are examined, as to whether satisfactorily and properly arranged, and supplied with the necessary apparatus and fixtures. 3. All medicines are physically and chemically proved, and are required to be of the best quality,—and in such quantities as the size of the business demands. By this manner of control only the best quality of medicines can be kept on hand; and the only manner in which the *Apotheke* can commit a fault is in not putting the proper quantity of medicine in a preparation. If in any part of the *revision*, deficiencies are found, they are entered on the protocol, which is

then sent to the proper officers of the Government. Where deficiencies are found, the Government orders the Judicial Physician of the District in which the *Apotheke* is situated, to demand in writing that the apothecary shall remedy such deficiencies within a proper time; if after this time the evil is not remedied, he is punished by a fine. The revision of the *Apotheke* is conducted in the presence of the Judicial Physician and the magistrate of the district. No previous intimation is given to the Apothecary of the time of the revision, and during this time the examiners are obliged to lodge and board themselves.

5th. All poisons, according to the German regulations, are required to be kept in a separate apartment, under lock and key. No poison is allowed to be dispensed, without the buyer presents a certificate from a magistrate, which gives the apothecary the special privilege to do so. This certificate is then to be entered in the Poison book, where it must be preserved under lock for at least twenty years.

6th. The *Apotheke* is responsible for an error made by a physician in his prescription when he dispenses it without first inquiring privately from the physician if it is his intention that the prescription should be so dispensed; if he still demands the quantity ordered, the *Apotheke* is obliged to prepare it, and is not responsible for any consequences that may follow.

7th. In the Kingdom of Hanover the sale of patent medicines is forbidden. The *Apotheke* does not engage in such traffic, though in some other parts of Germany I have heard of patent medicines being sold in the shops of merchants, &c.

8th. A candidate for examination must be prepared in *botanical* knowledge.

9th. It is required that he must have a theoretical and practical knowledge of Botany, which must be obtained by attending lectures and demonstrations, and by making botanical excursions.

10th. In the branch of Mineralogy a pharmaceutical student is only required to know those minerals from which the preparations used in pharmacy are obtained.

11th. With very few exceptions the physician and apothecary are on the best terms; but no pecuniary relations are allowed to exist between them. It is strictly forbidden by law for an *Apo-*

theke to make a present to the physician for the purpose of obtaining his patronage.

12th. Owing to the strict regulations in regard to those who dispense the medicines, errors seldom occur. In the Kingdom of Hanover only one case occurred in the last twenty-five years, in which an apprentice gave tinct. opii instead of tinct. jalapæ. In such cases the apothecary is answerable, and it is therefore necessary for him to pay particular attention to his apprentices and assistants. If an accident should occur through carelessness in this respect, and after the proper warning more attention is not paid to it, the *Apotheke* can then be compelled to dispose of his business, or put it under the direction of a sworn manager.

13th. The expenses of a student whilst in attendance at the University is different in various parts of Germany. In Berlin his yearly expenses would reach 400 American dollars; in Göttingen from $250 to $300, and in some parts of South Germany it is still cheaper. The examination fees are fifteen dollars. Quite a number of gratuitous scholarships are found amongst pharmaceutical students; these are granted by the proper authorities, when a young man can show that he has not the sufficient means to finish his pharmaceutical education.

In finishing these remarks, allow me to call your attention to a very complete and able article on the State of Pharmacy in Germany and Prussia, by M. Bussy,* republished in late numbers of the London Pharmaceutical Journal and Transactions. They include a large extent of information, and are in all respects to be relied upon. In some of my answers I may have been somewhat too concise, owing to a press of time; but I hope the time is not far off when I can give you more full and verbal answers to your inquiries. As I have devoted a large portion of my time to Botany, my collections have been more botanical than pharmaceutical, though it has been my object to increase my collections in all branches belonging to a pharmaceutical student.

Trusting that you may long be spared to fulfil your useful position,

I remain yours, truly,

SAMUEL S. GARRIGUES.

To PROF. WILLIAM PROCTER, JR.

* See pages 323 and 425 of this volume.—ED.

THE ALKALOIDS AND PROXIMATE PRINCIPLES.

By James C. Ayer.

Perhaps no subject within the range of their art is better worth the attention of pharmaceutists at the present time, than the elimination of the curative proximate principles of medicine into purity, *and their application to practical purposes.* None fail to appreciate the value of those which have been reduced to common use, while all seem to overlook the possible importance of those that have not. Morphine is not more superior to opium, or quinine to bark, than are the active principles of many medicines over the crude parent drug which is now employed. The several deleterious substances present with morphia in opium, prove the superiority of that alkaloid, as a remedial agent, to opium, or any preparation of it that could be made. The like relative value is known to exist in so many other cases, that it may be safely inferred for a large proportion of all the drugs whose virtues consist in a within contained alkaloid or proximate principle.

Since almost all the vegetable remedies do owe their activity to this cause, it may be seen how large a proportion of all the medicines in use are as unskilfully given as would be the grinding of corn, cob, husk, stalk and root into meal, while the kernel only can nourish.

Many valuable curative agents are so encumbered by the accompanying deleterious or offensive substances with which they exist, as to be nearly or quite useless. This was true of the cod-liver oil, until scientific skill had succeeded in affording it to the market in a state admissible to the stomach; and is still true to some extent of the castor oil.

True, almost every article of medicine, where an active principle could be looked for, has been submitted to the searching investigations of the chemist, whose labors have given us more or less insight into the composition of them all. Proximate principles have been separated, and processes given for their preparation sufficiently available for experimental purposes. Hence, it is not the discovery which is needed now, but the application of discoveries already made.

The remedies patent to improvement are too numerous and too obvious to need enunciation here, so that I will no more than sug-

gest to your readers whether there does not lie in this direction an open field of enviable usefulness.

PHARMACEUTICAL NOTICES.

By William Procter, Jr.

SUCCUS TARAXACI PARATUS.

The preparations of Taraxacum, or *dandelion* root, have within a few years past attracted considerable attention from the medical profession, and have been an object of experiment from skilful pharmaceutists both in England and the United States. The hurtful effect exercised by heat in evaporating solutions of the soluble matter of dandelion, has long been noted, and many recollect the molasses-like extract which formerly was too commonly seen, unmarked by any distinct, sensible property of the recent root. The application of spontaneous and vacuum evaporation in making the solid extract, demonstrated this beyond cavil, and in the last U. S. Pharmacopœia directions were given for this precaution, as well as in regard to the period of collecting the root. The *Liquor Taraxaci* (fluid extract) described by Mr. Redwood in Gray's Supplement, is prepared by macerating four pounds of the recently dried root in sufficient cold water for 24 hours, expressing, and evaporating to 36 fluid ounces, to which liquid 12 fluid ounces of alcohol is added; hence each fluid ounce of the preparation represents a troy ounce of the *dried* root. The dried root of the dandelion is more easily extracted than when it is recent, owing to the glutinous character of the juices and the difficulty of effectually disintegrating the tissue of the root, so as to completely reach the contained matter by menstrua; yet it is more than probable that the evaporation of the aqueous solution to the proper degree of concentration, not to speak of the effect of the process of drying the root in the first place, injures the product. This is partially avoided by a process which I published in the 20th volume, page 86, of this Journal, the *recent* root being employed, and the resulting preparation representing about twice its weight of the fresh root. In the preparation about to be described, the virtues of the root, be they what they may, are preserved unimpaired, as no heat

is employed in the process; the natural juice of the plant being merely admixed with sufficient alcohol to preserve it from change.

Take of fresh Dandelion Roots (collected in September or October) twenty pounds, (*av.*)

Alcohol, 835 sp. gr. four pints.

Slice the roots transversely in short sections, and by means of a mill or mortar and pestle reduce them to a pulpy mass; then add the alcohol and mix them thoroughly. The mixture thus far prepared at the season when the root is proper for collection, may be set aside in suitable vessels; stoneware jars are appropriate; and extracted as the preparation is needed through the other seasons. After having stood a week, or until a convenient time, the pulpy mass is subjected to powerful pressure, until as much as possible of the fluid is removed. This is then filtered and bottled for use. It is necessary that sufficient time should elapse after the pulp is set aside for the alcohol to penetrate the fibrous particles and commingle with the natural juices, as well as for the woody structure of the root to lose its elasticity, that it may yield the juice more completely on pressure. When the pulp has stood six months in this manner it yields the juice with great readiness, and possessed of the sensible properties of the dandelion in a marked degree. When eight pounds, avoirdupois, of the root is thus treated, after standing several months, the practical result is about six pints of fluid, with an ordinary screw-press. This yield will vary in amount with the condition of the root when collected, and the length of time it is exposed afterwards, as well as the power of the press used. Should the alcohol in this preparation be contraindicated, it might be partially removed by exposure in a water bath until the juice was reduced to five-sixths of its bulk, and then for every pint of the residue, eight ounces Troy of sugar may be added and dissolved in it.

NOTE ON CUCUMBER OINTMENT.

Several years ago (April, 1847) I published in this Journal a note on the preparation of Cucumber Ointment, since when it has gradually come more into use as an emollient application to irritated parts of the skin. It may not be improper to again call attention to the preparation and the mode of preparing it.

Take of Green Cucumbers, (suitable for table use,) 7 pounds, *av.*

Lard, (the purest and whitest,) 24 ounces "

Veal suet, (selected,) 15 ounces "

The unpared cucumbers, after being washed, are reduced to a pulp by grating, and the juice expressed and strained. The suet is cut in small pieces, and heated over a salt water bath until the fat is fused out from the membranes; the lard is then added, and when liquefied is strained through muslin into a wide-mouthed earthen vessel capable of holding a gallon, and stirred until it commences to thicken, when one third of the cucumber juice is added, and beaten with the ointment by means of a wooden spatula until its odor has been almost wholly extracted. The part that separates by standing is decanted, and the other two thirds consecutively incorporated and decanted in the same manner. The jar is then closely covered and placed in a water bath until the fatty matter entirely separates from the exhausted juice. The green albuminous coagulum which floats on the surface is then skimmed off, and the jar put aside in a cool place that the ointment may solidify. The crude ointment is then separated from the watery liquid on which it floats, melted, and strained; a part into a jar and closely sealed for keeping, the remainder into a mortar, and triturated with a little rosewater until it is very white and creamy, for present use. It is usual to keep this ointment in glass jars covered with rosewater, to prevent access of the air.

FLUID EXTRACT OF HYOSCYAMUS.

The following formula was communicated by Mr. Charles Augustus Smith, of Cincinnati, who states that the preparation it affords has been much used and liked in that city. When made from carefully dried and good hyoscyamus, it must be a fair representative of the plant.

Take of Hyoscyamus leaves, (garbled,) eight ounces (Troy.)
Diluted alcohol, - - a sufficient quantity.
Sugar, - - - - eight ounces (Troy.)

Reduce the hyoscyamus to a uniform coarse powder; pour over it a pint of diluted alcohol; allow it to macerate twenty-four hours; put it into a suitable percolator, and, when carefully packed, pour gradually on it diluted alcohol, until three pints of tincture has passed. The flow should be very slow, that thorough exhaustion of the leaves shall take place. The tincture is then evaporated to ten fluid ounces—the sugar dissolved in it while hot, and when cold two fluid ounces of alcohol (.835 sp. gr., or as much as is

sufficient to make the whole measure a pint) is added, and the fluid extract passed through a fine muslin strainer.

This preparation affords an admirable means of prescribing henbane in fluid preparations. The alcohol of the tincture is avoided, and the trouble of incorporating the solid extract superseded. It is of the same proportional strength as the fluid extract of valerian, and the dose varies from 15 drops to half a teaspoonful, the latter dose being equivalent to two or three grains of extract.

When the apothecary has in possession solid extract of hyoscyamus of *ascertained* good quality, a fluid extract of similar strength may be obtained by triturating half an ounce of the extract with ten fluid ounces of water till dissolved;—eight ounces of sugar dissolved in it, and finally sufficient alcohol to make it measure a pint, and strain. Practically, henbane yields but 5 per cent. of extract; the above recipe assumes it to be 6¼ per cent.—a difference altogether proper in view of the possible injury to the juices in preparing the extract originally.

ON SYRUP OF PHOSPHATE OF LIME.

By A. B. Durand.

Having been requested by a medical friend to prepare a syrup of phosphate of lime, I undertook a series of experiments in order to ascertain the best means of making such a preparation; and have adopted the following formula as the most eligible for accuracy and facility, as also for the superiority of the product. Thinking that some of the readers of the Journal may find it useful, the formula is at their disposal:

Take of	Precipitated phosphate of lime,	128 grains.
	Glacial phosphoric acid,	240 grains.
	Sugar, in coarse powder,	7½ oz., (Troy.)
	Distilled water,	4 fluid ounces.
	Essence of lemon,	12 drops.

Mix the phosphate of lime with the water, in a porcelain capsule, over a spirit or gas lamp, or in a sand bath, add gradually the phosphoric acid until the whole of the phosphate of lime is dissolved. To this solution add sufficient water to compensate for the evaporation; then dissolve the sugar, by a very gentle heat, and, when perfectly cold, add the essence of lemon.

The syrup of phosphate of lime thus prepared is colorless, transparent, of an acid taste, and contains two grains of the phosphate of lime and nearly four grains of phosphoric acid to each teaspoonful, and has been found to be more acceptable to the stomach than the solution of phosphate of lime usually prescribed. When diluted by the patient previously to its being taken, it forms a phosphoric lemonade not unpleasant to the taste.

ON ERGOT OF RYE.

By H. L. Winckler.

The author, at the beginning of the harvest of last year, collected ergot of rye, which he has dried at 139° Fahr., pulverized, and extracted first with ether and then with water.

The watery extract was treated with strong alcohol, and separated from albuminous matter by filtration. The spirit was distilled off, and the residue brought to dryness. During this operation a small quantity of a brown powder, (the ergotine of Wiggers,) was precipitated, which again dissolved in the concentrated liquid.

The ethereal extract contained the fatty oil, which was equal to 34 per cent. of the ergot of rye. The residue of the watery extract treated with alcohol (Winckler's extractive ergotine) dissolves readily in alcohol and water under the precipitation of a light brown powder (the ergotine of Wiggers.) It has a bitterish, cooling taste, and afforded, when distilled with quick lime, a distillate with the odor of herrings, containing propylamine or trimethylamine, but no ammonia. The residue consisted of a compound of secaline (that is, the beforementioned volatile base) with ergotine (Wiggers.) The latter body Winckler regards as an acid.

By treatment of ergot of rye with alcohol acidified with sulphuric acid, the author extracted a red ferruginous coloring matter, which has a great resemblance to bluthämatin.

The chemical constituents of ergot of rye are, according to the author, secaline in combination with ergotine, the red ferruginous coloring matter with a base yet to be eliminated, albumen soluble in water and in a coagulated condition, a large quantity of fatty oil, which in the normal grain appears to be replaced by amylon, fungus sugar (Wiggers,) which disposes the watery extract of ergot of rye so strongly to fermentation, formiates and phosphates.

These are the most important constituents. The specific action of the ergot of rye can only be ascribed to the secaline compound or the coloring matter, or to both of these compounds together, as, according to all experience, it does not belong to the fatty oil.

The powdered ergot of rye intended for medical purposes should be dried at a temperature not exceeding 139° Fahr., and preserved completely dry in a vessel impermeable to the atmosphere. The powder preserved in this manner appears almost odorless, of a light grey blue color, but evolves the peculiar odor of ergot of rye directly it is moistened with water. The watery extract, particularly that prepared with finely-powdered ergot, in the cold, or treated with cold water, and then evaporated in a water bath, possesses the peculiar odor of ergot of rye, affords by distillation with caustic lime a considerable quantity of secaline and ammonia, and contains without doubt the greatest portion of the active constituents of the ergot of rye; but it cannot be kept. The spirituous tincture, prepared with alcohol of 40 per cent., by several days' digestion at an ordinary temperature from finely pulverized ergot, appears of a dark brown color, contains all the active constituents of the ergot of rye, and very little fatty oil, which separates in a crystalline form at very low temperatures.

The spirituous extract is best kept and most effective when it is prepared by twice extracting the fine powder with an equal quantity of cold distilled water, clarifying the concentrated extract, and treating it with alcohol of 80 per cent. as long as a precipitate results on the addition of a fresh portion. The spirituous fluid is after 24 hours separated from the precipitate by filtration; the filtrate subjected to distillation in a water bath, and the residue evaporated to the consistence of an extract. The extractive ergotine prepared in this way is a little hygroscopic, possesses a light brown color, a slight narcotic odor, dissolves under the separation of a little ergotine (Wiggers) in water, and evolves, when treated with a solution of caustic potash, in a high degree, the penetrating odor of secaline. By distillation of the concentrated watery extract with caustic lime a very concentrated solution of secaline is also obtained.

Winckler recommends for further investigations on the activity of the ergot of rye the pure muriate of secaline, the neutral compound of secaline with ergotine, the red coloring matter, and the

neutral compound of ergotine with ammonia. Winckler has found the compound of ergotine with secaline (ergotinate of secaline) in the black sporous mass of *Lycoperdon cervinum.*—*Annals of Pharm.* July, 1853, from *Central Blatt.*

A NEW MODE OF DETECTING STRYCHNIA AND ITS SALTS.

Dr. Edmund William Davy, a lecturer on chemistry in one of the Dublin medical schools, whose scientific researches in chemistry, in connexion with medicine and pharmacy, have been frequently noticed in the "Annals of Pharmacy and Practical Chemistry," has communicated a valuable paper on a new method of detecting strychnia and its salts, to the "Dublin Quarterly Journal of Medical Science." In the course of some recent experiments on strychnia, he discovered the following method of detecting this alkaloid and its salts. To a little of the strychnia, in powder or in small crystals, add a drop of undiluted sulphuric acid, so as to moisten it, then a little of the ferrocyanide of potassium (red prussiate of potash) in powder, or a drop of a strong aqueous solution, and mix them well together, when a fine deep violet color will be immediately produced. This test is one of such extreme delicacy, that a quantity less than the one thousandth part of a grain will afford an intense violet, which can be extended over a considerable surface. As an additional proof, he dissolved the fiftieth part of a grain of strychnia in one thousand grains of distilled water; one drop of this solution, weighing one grain, on being evaporated on a surface of glass, and treated as referred to, afforded a faint, but characteristic violet shade, though containing only the one fifty-thousandth part of a grain of the alkaloid. This test, proposed by Dr. Davy, he affirms to be quite equal in point of delicacy to M. Lefort's, whilst, at the same time, it possesses certain advantages over that; the violet color produced by Dr. Davy's test is more permanent than in that produced by M. Lefort's, and in this last, the violet color quickly changes to a brown or olive shade, whereas, in Dr. Davy's, it passes more slowly into a light brick-red color, which remains for several hours, and is in itself highly characteristic. Dr. Davy states that his test appears to be less affected by the presence of organic matter than is that of M. Lefort; thus, in M. Lefort's, the pres-

ence of a little alcohol, ether, or sugar, with a solution with the strychnia, destroys the test immediately, and instead of the violet color, a green color is produced; whereas, in similar circumstances, by the use of his test, the characteristic violet color is produced, being little affected by the presence of these substances. From a series of comparative trials with both these tests, Dr. Davy finds that the vegetable matter in ale and porter has a less injurious effect with his test than with that of M. Lefort. In cases where strychnia is present along with organic matter, Dr. Davy recommends that the latter should first be separated as much as possible from the strychnia, by means of some of the methods in use for that purpose, as the presence of organic matters interferes more or less with the application of either one or the other test, and in both tests it is necessary that the sulphuric acid employed should be undiluted, for he finds that if the acid be much weaker in strength than that of a specific gravity 1.488, the desired effect will not be produced. M. Lefort's test for the detection of strychnia is prepared by moistening this alkaloid with undiluted sulphuric acid, and then adding to it a little bichromate of potass, when a fine violet color is produced. This method has, as is well known, been commonly considered as the most delicate and characteristic test for the detection of strychnia, even when in combination with organic matters of various descriptions.—*Annals of Pharmacy.*

ON THE PREPARATION OF NITRO-PRUSSIDE OF SODIUM.

By A. Overbeck.

The salt discovered by Playfair, which is produced with evolution of oxide of nitrogen, cyanogen, nitrogen and carbonic acid, by the action of nitric acid upon prussiate of potash, is only separated with difficulty from some substances which are also dissolved in the fluid. From this fluid, which is brown, nitrate of potash and oxamide separate; and after neutralization with carbonate of soda and subsequent heating, a green or brown precipitate is deposited.

The separation of Playfair's salt from the nitrate of potash by Playfair's process, has given the author no satisfactory result, because the selection of the two kinds of crystals is very wasteful of time. Kyd also appears to have succeeded no better, since he has adopted another course. The author could not find the point at

which the nitro-prusside of sodium first crystallized, by trying the fluid on the sand-bath with the thermometer at all temperatures from 176° F. downwards. By spontaneous evaporation also he always obtained a mixed crystallization, both salts forming in intimate contact. The method given by Kyd for the preparation of the nitro-prusside of copper has also its particular difficulty. Without taking into consideration that the smallest excess of caustic soda in the decomposition of the nitro-prusside of copper contaminates the product with an alkaline ferrocyanide, a pure green precipitate is not always obtained on precipitation with sulphate of copper; it is frequently reddish from ferrocyanide of copper, the formation of which is not to be avoided when there is an excess of carbonate of soda, and which is intimately connected with the brown color of the precipitate formed by boiling the neutralized fluid.

According to the experiments made by the author with reference to Playfair's further statements, the following method is adapted to furnish the salt pure:—

5½ parts of commercial nitric acid, diluted with an equal weight of water, are poured over 4 parts of pounded prussiate of potash in a retort; after solution has taken place, which is generally completed in about ten minutes when the acid is of the usual degree of concentration, with strong evolution of the gases described by Playfair and the production of a coffee-brown color, the retort is placed upon the water-bath until a drop of the fluid gives a dingy green instead of a blue precipitate with a solution of sulphate of iron. The solution is allowed to cool, by which means a large quantity of nitrate of potash is separated, from which the green mother-liquor is poured away; from this all nitrate of potash is separated by repeated concentration. The fluid is then neutralized with carbonate of soda while being heated on the water-bath, taking care only to add the carbonate as long as a pure blue precipitate is produced. This is collected on a filter and washed. From the united filtrates the substance is obtained in the most perfect purity by spontaneous evaporation. The ruby-red prismatic crystals are washed with water, and dried between blotting-paper.

The crystals, as well as the solution, are best preserved in black bottles. At any rate, the solution must be carefully kept from the sunlight.—*Chem. Gaz.*, July 15, from *Archiv der Pharm.*

EXAMINATION OF FUSEL OIL FROM INDIAN CORN AND RYE.

By Charles M. Wetherill, Ph. D., M. D.

The researches of Guckelberger, Bopp, Keller, and others, who obtained, by the fermentation and oxidation of nitrogenized substances, such as gluten, casein, &c., the successive members of the series of acids, $C_nH_nO_4$, rendered it probable that such a succession might be detected in fusel oil, by employing Liebig's method of isolating these acids, a method which enables small quantities of one of the group to be separated from larger quantities of the other members. It was also interesting to make an examination of fusel oil obtained from the fermentation of Indian corn.

With respect to the history of fusel oil: as is well known, Dumas obtained it first from the fermentation of potatoes; Balard showed that with this, the oil obtained from the fermentation of grapes was in its principal constituent (amylic alcohol) identical; and Medlock and Rowney showed the same to be the case with the fusel oil of the English and Scotch grain distilleries.

With regard to the acids present in fusel oil, Mulder detected œnanthic, Kolbe, margaric, and Rowney, capric acid. Medlock, who examined a grain fusel oil for an alcohol of one of the fatty acids, obtained nothing but alcohol, water and amylic alcohol. Kent (*Am. Journ. Pharm.*, 1851, p. 354,) examined a specimen of fusel oil which contained acetic acid and valerianic acids, besides an ether, the acid of which was not isolated.

Wurtz (*Comptes Rendus*, xxxv. 310,) has recently isolated from potatoe fusel oil butylic alcohol boiling at 112° Cent.

In the subject of the present memoir, besides water and alcohol, formic (?),* acetic, caproic (?), œnanthic (?), and caprylic acids were detected, together with a small quantity of oil of turpentine, which probably proceeded from the barrel in which the substance was put, in the distillery, the proprietors of which were manufacturers of burning fluid.

The oil was obtained from the rectification of spirits made partly from rye, and partly from maize. It was neutral to test paper, of limpid, colorless appearance, like alcohol, and of strong

* The acids marked thus (?) were not obtained in sufficient quantity to obtain more than probably true analytical results.

fusel smell. The volume was not much diminished by agitation with water; but the water when distilled gave alcohol. When distilled with a platinum wire, the thermometer rose gradually from 92° Centigrade to 226°, at which temperature there remained a small portion of dark colored oil. At first water and oil came over, and then oil alone. A considerable portion had passed over before the thermometer indicated the boiling point of amylic alcohol; but by successive rectifications, removing the water, the great bulk of the liquid had the boiling point of 132°.

The following are the proportions of distillate for such a first distillation:

Boiling Point.	Fluid Ounces.
92°— 99° (2 layers)	4½
99 —109 (2 layers)	4½
109 —121	3¼
121 —130	4½
130 —134	16
134 —136	4½
136 —137	4½
137 —147	1¾
147 —168	2
168 —200 (yellowish)	⅛
200 —226 (yellowish)	½

There remained in the retort about ¾ oz. of a reddish brown liquid. When an alcoholic solution of caustic potassa was added to the members of this series, a bright yellow color was developed, which was deeper the higher the boiling point. After standing for some time, the liquids were shaken with water which was separated. They were then distilled, and the residue, which was dark and strongly alkaline, was washed several times with water; other portions of the fusel oil were distilled from aqueous and alcoholic solutions of potassa, and the alkaline liquids containing the fatty acids were united.

Examination of the Potassa Solution for Fatty Acids.—The potassa solutions obtained by uniting the alcoholic and aqueous solutions of potassa, were evaporated to dryness after several additions of water to expel the alcohol. They were then dissolved in water and decomposed in a retort, by dilute sulphuric acid, and distilled (with the addition of water) until it was supposed the fatty acids had passed over. The thumping of the retort, as the

sulphate of potassa separated on concentration, was avoided partly by removing the crystals, and partly by using a ring gas burner made from a tube, and by which means the upper portion of the retort could be heated, while the bottom was kept in sand. A small portion of dark matter was left with the residue and crystals in the retort. This was tested for fatty acids (after neutralizing the free acid and separating the sulphate of potassa by alcohol, by nitrate of silver; a very small quantity of whitish brown precipitate was obtained, which did not crystallize from boiling water.

The distillate containing the volatile fatty acids, consisted of an acid aqueous fluid, upon which floated drops of dark colored acid oil, of a peculiar rancid smell. A small portion of the aqueous fluid was neutralized by carbonate of soda, was added to the rest and distilled; nitrate of silver added to the solution of the residue in the retort caused a white precipitate, which immediately blackened on heating the test tube, indicating the presence of *formic acid*. The whole of the distillate was neutralized by carbonate of soda, and evaporated in vacuo; it crystallized in needles like acetate of soda. As the quantity was too small for an analysis, it was heated with sulphuric acid and alcohol in a test tube; the smell of acetic ether was distinct.

The fatty acids arising from decomposing the different potassa solutions were together in such small quantities, (although a gallon and a half of fusel oil was employed,) that they were united. About $\frac{1}{3}$th was neutralized by $NaOCO_2$, added to the whole, and distilled. Another portion of the distillate resulting from this experiment, was treated in the same manner, and finally the whole. The soda salts thus resulting, I call 1, 2, and 3; they were not in large quantity. A drop of the solution of each, evaporated upon a glass plate, was examined with the microscope.

No. 1 appeared in fibrous crystals converging towards the centre of the drop.

No. 2 appeared to consist of two different kinds of crystals, especially as seen by polarized light; one kind in one position of the plane of blue plumose crystals; and the other of white stellated prisms.

No. 3, evaporated at ordinary temperature, appeared in feathery stellated crystals.

In neutralizing the remainder of the liquid to prepare the salt, No. 3, as the fluid was approaching saturation, a peculiar motion was observed in the oil globules floating on the surface of the liquid; they were spasmodically agitated and repelled each other, moving quickly from side to side, very much as some animalculæ appear in the field of the microscope. It was not a rotation or movement like that of camphor, or the butyrate of baryta on water, though doubtless proceeding from the same cause.

Fatty Acids in Nos. 1, 2, *and* 3.—The soda salt, No. 1, the residue in the retort after the first neutralization by carbonate of soda, was dissolved in water and nitrate of silver added; the precipitate was very slight; the solution concentrated in the water bath darkened very much. The residue, after evaporation, yielded to boiling water, a small quantity of precipitate, insufficient for analysis, which separated on cooling. After evaporation once more in vacuo, over sulphuric acid, the residue evolved a strong smell of acetic acid when treated with sulphuric, and gave with sulphuric acid and alcohol, acetic ether.

The soda salt, No. 2, dried up over sulphuric acid in vacuo, to a gummy mass. On the addition of nitrate of silver to the solution, an abundant white precipitate fell, which was separated and redissolved in boiling water, from which the greater part was deposited on cooling. The remainder yielded but little to boiling water. I obtained enough of this precipitate to make two atomic weight determinations. It burned quietly and left a spongy mass of metallic silver, which left no residue on treatment with nitric acid. 0·11775 grammes of the salt gave 0·051 silver; and 0.128 gave 0·0555 silver, corresponding to a per centage of silver 43·26 and 43·35. Caprylate of silver requires by calculation 43·028. I had not sufficient of this salt for an organic analysis.

Soda salt, No. 3, which was slightly alkaline, was neutralized by nitric acid. The precipitate by nitrate of silver darkened slightly on boiling with water, with deposition of a small quantity of dark metallic silver on the capsule. A white curdy precipitate separated from the filtrate before cool, and on cooling, a further quantity of a slightly grayish precipitate. This latter precipitate, which dried at 100° C., weighed 0·0335, gave on ignition, 0·016 Ag., or a per centage of 47·74. The silver salt of œnanthic acid contains 47·161 per cent. of silver.

The white precipitate which deposited before cooling, was dried at 100°, and was very electric; it gave the following analytical results: 0·12 grammes yielded 0·052 metallic silver, or 43·33 per cent., which agrees with caprylate of silver. I performed the organic analysis by combustion with oxide of copper. The results do not accord so well for caprylate of silver, the quantity at my disposal being almost too small for an accurate analysis of this salt; 0·1875 grammes gave CO_2=0·25575, and HO=0·1115, or a per centage as follows:

		By Calculation.	
C_{16}	96	38·20	37·20
H_{15}	15	6·00	6·60
O_4	32	12·77	12·87
Ag.	108	43·03	43·33
	251	100·00	100·00

The filtrate from the first of these precipitations gave on evaporation in the water bath a residue, which yielded to a little boiling water a grayish salt, which precipitated on cooling. 0·027 of this gave 0·013 or 48·14 per cent. of silver. This would correspond to caproate of silver, which contains 48·43 Ag. The residue of oil of a portion of the fusel oil from which the above mentioned acids were separated, was treated with an additional portion of potassa, and the fatty salts separated from these aqueous solutions by chloride of sodium, and decomposed in a retort by sulphuric acid. The acids were boiled with baryta water, and filtered hot; a dark resinous substance was left on the filter. On cooling, a white flaky precipitate fell; carbonic acid passed through the filtrate from this precipitate, yielded a carbonate of baryta, from which scarcely anything could be obtained either by boiling water,* or by exhausting, when dry, with absolute alcohol.

The baryta salts of the fatty acids were in such small quantity that a separation and purification by crystallization was out of the question. They appear to consist of caprate and caprylate of baryta. This solution was evaporated in the water bath, removing the salt as soon as enough had separated to perform an atomic

* The boiling water gave, on cooling, 0·445 white precipitate, which contained 34·06 p. c. BaO.

weight determination. The following is the result, premising that—

Œnanthylic acid requires BaO per cent.,				= 38.44
Caprylic	"	"	"	36·20
Capric	"	"	"	31·94

The first salt that separated was in white imperfectly crystalline scales; 0·131 gave 0·0555 $BaOCO_2$, corresponding to 32·9 per cent. of baryta. In these crystallizations the salt separated, as a film on the surface of the liquid. The next salt, 0·53 gave $BaOCO_2$=0·252 or BaO p. c. =36·92. The last crystallization gave 0·194 grammes of a salt which yielded 0·091 carbonate baryta, or 36·43 per cent. of baryta.

Examination of the Alcohols of Fusel Oil.—The portion of fusel oil from which the fatty acids had been separated, was washed with water, and submitted to a fractional distillation. At first oil came over together with an under layer of water, which was removed, and the different products of distillation dehydrated with carbonate of potassa, and with fused chloride of calcium. A considerable portion of chloride of calcium was taken in solution by that portion passing over between 87° and 100°, and which crystallized out on cooling, and after standing, in prisms or lengthened tables, similar to the compound of chloride of calcium and water. As these crystals had a peculiar smell from which they could not be freed by pressure between blotting paper, or by exposure to the air, and as they seemed less deliquescent than the ordinary crystallized salt with water, they were fused to determine the amount of volatile matter, in order to ascertain whether perhaps they were not a compound of amylic alcohol and chloride of calcium. The loss was 49·78 per cent., which corresponds to the chloride crystallized with six equivalents of water, or 49·28 per cent.

After having dehydrated the portions collected between 81°—110°; 110°—132°; and 132°—136°, which last contained the great bulk of the oil, they were submitted to four rectifications, in which the following stadia were observed:

81°—84°—90°—100°—110°—120°—129°—132°—136° Cent.

The residue above 136° was not sufficient to cover the thermo-

meter. In the second rectification, 81°—84° was collected at 81°—82°—84°.

During the fourth rectification, the thermometer still continued to rise from 81°—136°; but nearly the whole of the oil was collected at 132°—136°, and the thermometer was longer stationary between 81°—84° than at any intermediate stadium. They all, where not masked by the odor of the fusel oil, (as in the case of the higher ones,) smelled strongly of turpentine. The distillate between 81°—84° was rectified, and what passed over at 81° collected. Its density at 19° was 0·8194; and it presented the characteristic of alcohol contaminated with some foreign substance. After having stood for a day over freshly ignited charcoal, water was added, in which it nearly all dissolved, giving a milky fluid, from which a little oil separated. Water was now shaken with the several distillates up to 81°—119° inclusive. The quantity of distillate was very much reduced by the water, and the resulting oil smelled strongly of turpentine. These oils, separated from the aqueous solution, stood over night upon charcoal, and were kept boiling for some time over fused chloride of calcium, so that the vapors flowed back into the flask; they were then distilled, in a wax bath, from the salt. The quantity of oil thus obtained was quite small. The chloride of calcium, when dissolved in water, set free a small quantity of oil of turpentine which was mechanically mixed with it.

Since the portion of oils passing at 120°—129° was the greatest in quantity after those already mentioned, I was desirous of forming the double sulphate, in order to ascertain by that means the presence of another alcohol besides amylic. I had three-fourths of a fluid ounce at my disposal, to which was added gradually an equal weight of oil of vitriol. After having stood for a few hours, there were two layers on the addition of water; the upper one a yellowish green oil, which diminished on the addition of more water. What remained undissolved, was in too small quantity for further examination; when rectified over carbonate of potassa, it began to boil at 115°, the boiling point at once rising. When suffered to evaporate upon the hand, it gave the smell of amylic alcohol and turpentine. The double sulphuric acid thus formed was neutralized by pure carbonate of baryta, and the baryta double salt, after evaporation to dryness in a water bath, was redissolved, fil-

tered and evaporated to crystallization. On cooling, crystals were obtained, which, under the microscope, and especially by polarized light, appeared as thin rhombic plates very much broken. I could not detect two different kinds of crystals. When dried for fifty hours in vacuo over sulphuric acid, these crystals presented the appearance of pearly scales, fatty to the touch. The mother waters gave a similar salt, and the mother water from these gave a small quantity of cauliflower-like crystals of the same appearance under the microscope; after having been dried in vacuo, their crystals blackened, and were decomposed when heated to 100° C.

The following is the amount of sulphate of baryta they contain, determined by incineration. They were difficult to burn, and after ignition they were moistened with a drop of sulphuric acid, and ignited a second time:

0·6105 gave $BaOSO_3$ = 0·30325 = 49·67 per cent.
0·58525 " $BaOSO_3$ = 0·2895 = 49·47 "

Anhydrous sulpho-amylate of baryta contains 49·49 per cent. of sulphate of baryta.

Towards the close of this investigation, I met with Wurtz's paper on the occurrence of butylic alcohol in a fusel oil examined by him. I was therefore desirous of looking for this body in the fusel oil under examination. The oils left by adding water to the product, 81°—119°, after having been treated as described, were in small quantity, and contained fusel oil and oil of turpentine, besides a little water. They began to boil at 105°, and were separated in two portions; those passing between 106°—110°, and those above 110°. These two portions were treated with sulphuric acid, and the baryta salts formed. Of these, only the liquid passing at 106°—110°, yielded enough for analysis, which was rendered uncertain by having unfortunately used for neutralization native carbonate of baryta which contained lime, and which was only discovered on examining the salts under the microscope, when the crystals of sulphate of lime were detected. The solutions were then evaporated to dryness, and exhausted with alcohol. The salts proceeding from the distillate above 110° yielded a small quantity of confusedly crystallized granules, not sufficient in quantity for analysis. The remaining portion gave a salt appearing in lance-

shaped crystals under the microscope. The following is the analysis of the salt:

1st Crystallization 0·184 gave 0·07875 $BaOSO_3$ = 43·21 per cent.
2d " The mother waters yielded on concentration, 0·14675 of a salt which contained 0·06875 $BaOSO^3$ = 47·02 per cent.

Both of these sulphates of baryta contained a small portion of sulphate of lime. The following is the quantity of fixed sulphate in three of the vinic acids:

Sulpho-vinate,	Lime, Baryta	Sulphate	46·89, 60·23
Sulpho-amylate,	Lime, Baryta	Sulphate	36·36, 49·49
Sulpho-butylate,	Lime, Baryta	Sulphate	39·31, 52·62

It appears most probable that the salts analyzed were sulpho-amylate of baryta with a little lime, and possibly mingled with sulpho-vinates. I have not therefore been able to detect Wurtz's alcohol in the specimen of fusel oil from maize and rye. Different specimens of fusel oil appear to vary in the nature and quantity of their constituents. The specimen just examined contains but a very small quantity of the fatty acids.—*Journal of the Franklin Institute, June*, 1853.

ON THE STATE OF PHARMACY IN GERMANY AND PRUSSIA.

By M. Bussey.

(Concluded from page 333.)

THE CONCESSIONS.

In Prussia the mere diploma of pharmaceutist is not alone sufficient to entitle its possessor to carry on business; it is necessary that he should obtain special authority to do so—a concession—as it is termed. Formerly these concessions were absolute privileges exclusively in favor of those who had obtained them, but at the present time they are so no longer, the government having reserved to itself the right, which has been confirmed by usage for some considerable time, of granting permission for the establishment of new pharmacies wherever it may appear desirable, and without regard to existing concessions.

There are several classes of privileges:

1. The absolute privilege, "real privilegium," which has existed until recently, and in virtue of which the government has no power to authorize the establishment of new pharmacies in places were privileged pharmacies were already in existence. The "real privilegium" is now abolished in Prussia, and throughout almost the whole of Germany.

2. The limited privilege, which differs from the above only in the circumstance that the government has the power, when it appears desirable, to grant new privileges without being in any way bound to indemnify those pharmaceutists who already possess the privilege. All the pharmaceutists who possess the "real privilegium," are in point of fact subject to this condition.

3. Besides these, there are the concessions, which refer to the establishment of new pharmacies; they are a kind of privilege possessing a more personal character than the preceding ones. Thus, the limited privilege may be sold or transferred to another person, without any intervention of the government; it is only necessary to have been admitted as a pharmaceutist by examination, to have a right to purchase and make use of it. This privilege is in some sort attached to the business itself, and admits of being mortgaged.

The concession, on the contrary, is essentially personal; it is not legally and necessarily saleable and transferable like the restricted privilege, it cannot be ceded by one person to another without the intervention of the government authorities. The pharmaceutist possessing a concession, and who is desirous of selling his business, is obliged to inform the government of his intention, and to present a successor who shall be considered appropriate.

In all practical cases there is but little difference in the modes of transferring pharmacies, whether the business is carried on under a privilege or a concession, the government having hitherto always given their consent in a very liberal manner to the sale of pharmacies carried on under concessions.

Thus, the only difference which exists with regard to the pharmaceutist who purchases a business under a privilege or a concession, is, that in the former case he is not subjected to any other formality by the government than to present his diploma and take the necessary oath, while in the latter case it is neces-

sary, besides this, to obtain a transfer of the concession in favor of himself. This, however, does not involve any great difficulty.

In some of the German States, however,—the grand duchy of Baden, for example—the intervention of the government in the transmission of concessions is more than a mere formality, for in these states the administration nominates the successor. In this case, the pharmaceutist resigning his business cannot demand more than the value of the stock in his shop, according to the valuation of a competent person. Thus, whoever succeeds in this manner to the business of a pharmaceutist, gains, together with the concession, the advantage of his predecessor's connexion. Here, likewise, there are in practice several modifications, which to some extent lessen what would appear to be a measure of extreme rigor; but these modifications, whatever they may be, cannot entirely do away with the arbitrary character of this legislation.

When the business of a pharmaceutist passes by heritage, by purchase, or otherwise to a person who does not possess the title of pharmaceutist, he is obliged to dispose of the business within the space of one year to a qualified pharmaceutist, and during this time it must be carried on by a sworn manager.

The widow of a pharmaceutist is permitted to carry on the business of her husband, under the direction of a manager, until the children attain their majority.

The extent of the population is generally the ground upon which permission is given to establish a new pharmacy, but there are no positive regulations with regard to this point. The number, which appears to be tacitly recognized by the government and confirmed by custom is, for the dense population in towns one pharmaceutist to every six thousand inhabitants; for rural populations the proportion of pharmaceutists is more considerable. Within this limit the government does not countenance the establishment of new pharmacies.

There are at	Berlin	43	pharmacies for a pop. of	450,000,	or 1 to 10,465
	Leipsic	4	"	55,000*	" 13,750
	Dresden	10	"	90,000	" 9,000
	Hanover	4	"	30,000	" 7,500
	Frankfort	10	"	60,000	" 6,000
	Mayence	7	"	35,000†	" 5,000
	Cologne	15	"	95,000	" 6,333
	Aix-la-Chapelle	7	"	50,000	" 7,143

* A new pharmacy is about to be established in Leipsic.

† Besides a garrison of about 15,000 men.

In the towns belonging to the Rhenish provinces, it will be seen that the proportion of pharmacies is much greater than in the former. This is a consequence of the occupation of the country by the French, and of the régime introduced by them. But it is presumed to be the intention of the administration not to permit the establishment of any new pharmacies, until the national increase of the population shall have brought them into the same proportion as in the other provinces.

In those parts of Germany where the ancient privileges still exist, the government has sometimes experienced difficulty in establishing new pharmacies.

At Leipsic, the authorities having recently announced their intention to grant a new concession for a new pharmacy, the four pharmaceutists in business there regarded this measure as a violation of the privilege, and opposed it. The Saxon government was obliged to compromise the matter with them, and it has been arranged that the first and second pharmacy that is established, besides the four already existing, shall belong to the pharmaceutists of the town, who will conduct them by means of managers, or sell them to pharmaceutists possessing a concession; and that, for this advantage, the government shall have the right, at a later period, when the wants of the population call for it, to grant a third or even a fourth concession.

When an application is made for a concession, it is always the local authority, the "burgomeister" or mayor, who takes the initiative; he consults the "physicus" of the district upon the subject. When the inspector and municipal authorities are unanimous in their opinions as to the necessity for a new pharmaceutical establishment, the application is addressed to the medical board of the province. When the reasons assigned are found upon inquiry to be sufficient to justify the application, the board gives an opinion favorable to the applicant, if there are not already any pharmaceutists in the locality, or if those already established have no valid objection to offer.

The circumstances which are most especially taken into consideration with regard to the establishment of a new pharmacy, are, any considerable increase in the population or wealth of the district in question. According to the terms of the regulation of January 17th, 1845, the concession is granted by the superior President of the province.

The ministerial instructions of the 13th of July, 1840, indicate the course to be pursued when several applicants compete together for the same concession; so that, as far as it is possible to judge, the concession may be granted to the most worthy applicant—the one who presents the greatest guarantee of competence; but there is no fixed rule with regard to this, and whatever precautions the superior administration may adopt, it is difficult to prevent some degree of partiality in the granting of concessions. It is, moreover, impossible to avoid the suspicion of partiality, notwithstanding the confidence placed in authority in Prussia. I have been assured that there is no lack of instances in which persons, having obtained concessions through interest, instead of making use of them themselves, have, after a short time, sold them, and realized sums of from thirty or forty to fifty thousand francs. Whatever may be truth of these statements, it cannot but be acknowledged that this part of the system is very defective, and, according to the opinion of all competent persons, stands greatly in need of reform.

But even supposing that the choice of the government is perfectly appropriate, that the concession is always given to those who, in their examinations, have shown themselves to be the most competent, to those who, in all respects, really merit the preference, the successful applicant always gains an advantage which is not justified by the circumstances, or which is at least out of all proportion to the merit which he may be supposed to possess. It is conceivable that the government should confer such a privilege as a national recompense for great public services; but it does not appear why such a privilege should be the recompense for having merely passed an examination with greater or less success. In order to be just towards pharmaceutists, and at the same time to exonerate the government from the responsibility thrown upon them by the necessity of choosing between several rival candidates, it would appear to be more appropriate, whenever the wants of the population called for the establishment of a new pharmacy, that the government should compel the pharmaceutists of the locality to establish the business for their own profit; and that the government should restrict itself to granting a concession to the pharmaceutist who should present himself as the owner of the new business.

In those countries where, as in Prussia, the number of pharmaceutists is limited, and the price of medicines regulated by authority for the entire kingdom, the pharmaceutists may be regarded as adventurers who at their risk and peril provide the public with medicines. If the population decreases they have to bear the concurrent diminution in their income—a depreciation of their property of which no account is taken. Consequently it appears just, if the population increases, that they should not be deprived of the benefit of that increase, and that if it is requisite to establish a new pharmacy for the service of the public, that it should be established by them and to their profit.

TAKING THE OATH.

The pharmaceutists in Germany are bound to take an oath upon commencing business. This oath is taken before the "Kries Physicus," who administers it. The oath is likewise required by the French Government; but the practice has either fallen into disuse or is not fulfilled in such a manner as to effect the desired result. In most instances it is a mere formality which resolves itself into a certification that the oath has been taken appended to the diploma by a subordinate official, and frequently there is not even any mention made of the oath. Nevertheless, if there is any profession in which an appeal to the conscience of those who exercise it is necessary, it is certainly that of the pharmaceutist. It is too often forgotten that in the practice of his art the pharmaceutist, in spite of the severity of the laws which relate to him, may very readily fail in the fulfilment of his duties, that in such cases there are frequently no other witnesses of his acts but himself, and no other judge but his conscience. To it, therefore, must be directed in the first instance any attempts of preventing such dereliction of duty, without, however, abandoning the means of repression provided by the law. It would, therefore, be desirable to re-establish the ceremony of taking the oath—to attach to it even a certain solemnity, and whatever else might tend to insure that moral influence which is sought to be exercised.

Certain definite periods might be fixed for this ceremony, such as the opening of the schools of pharmacy, when the oath might be taken in the presence of the assembled professors and a cer-

tain number of pharmaceutists, specially convoked for the purpose.

In places remote from the schools the oath might be administered with the same forms by the President of the tribunal of the district.

If the ceremony of taking an oath is allowed to be of any influence, this ought assuredly to attach to such a one as is taken in the presence of the profession, of the body charged with the supervision of the practice of pharmacy, of the magistrate whose duty it is to prosecute and punish any who may be guilty of infractions of the laws relating to the profession; but in the manner that it is observed at the present time this ceremony is but an empty formality, to which the pharmaceutist who is supposed to take it attaches no more importance than the functionary who ought to receive it.

THE TARIFF FOR THE SALE OF MEDICINES.

The limitation of the number of pharmaceutists necessarily involves the establishment of a fixed price for medicines. These prices are agreed upon and regularly revised every year by a commission appointed for that purpose by the government. If the price of any important drugs undergo any considerable alteration, the commission make a corresponding alteration in the price of medicines prepared with them. These alterations are published by the government, which is likewise bound to transmit to the commission the current price of drugs, chemical products, and all the data which are likely to be useful in constructing the tariff.* The pharmaceutists are compelled to adhere strictly to the prices laid down in the tariff. Generally speaking, they fulfil this duty faithfully. In any case, the detection of any false charge would be very easy, for the pharma-

* The tariff includes not only the price of simple medicines, but likewise the charges for manipulations.

The Prussian tariff, which is especially alluded to here, is not adopted throughout Germany. It varies like the Pharmacopœia in each State, and frequently within very circumscribed localities. These differences in the price of medicines have recently been taken into consideration by the pharmaceutists, and at a congress held at Frankfort, on the 23d of September, 1852, to which all the pharmaceutists of Germany were convoked, it was seriously discussed whether petitions should not be addressed to the different governments for the establishment of one uniform tariff and pharmacopœia for the whole country.

ceutist being required to write upon the prescription the price of the medicine, he thus, if he makes too high a charge, writes his own merited condemnation.

In case of any overcharge being made—which is, however, very rare—the pharmaceutist has to pay a fine, the amount of which depends upon that of the overcharge. It varies, moreover, in different states, but is also proportionately heavier when the overcharge is considerable. It is obvious that in the face of such a simple means of detection, the pharmaceutist will not willingly venture to lay himself open to the infliction of a penalty, which may be attended with a loss of his concession.

The pharmaceutist is not allowed to make a charge below the tariff any more than above it. The law having by the Pharmacopœia fixed the composition of each medicine, the mode of preparing it, and such a value as leaves to the pharmaceutist a reasonable remuneration for his labor, does not recognize the possibility of his selling them for less than the regulated price without deteriorating their quality. He is not indeed prevented from exercising charity, but he must not, in the exercise of his profession, commit any act which would afford grounds for suspicion.

Such a tariff certainly appears to be a most arbitrary imposition when regarded in the light in which we are accustomed in France to look upon free competition in all matters of industry and commerce. But if the question is examined apart from any prejudice in favor of that principle of liberty which obtains in our commercial legislation; if, without any preconceived ideas on the subject, it is examined in a practical point of view and with regard exclusively to the interests of the public, it will not be difficult to arrive at a conviction that the system of restricted liberty adopted in Germany for the sale of medicines is preferable to that of absolute liberty which exists in France. In fact, free competition, such as is generally practised in commerce, is altogether inapplicable to Pharmacy, and may produce, as it has done in commerce, the most disastrous results.

The advantages which are attributed to competition in affairs of industry and commerce are the greater cheapness and improvement of the products. But the possibility of excelling others in advancing any branch of industry and selling at a

lower price than others, when that cheapness is not, as is too frequently the case, anything more than the result of fraud or falsification, necessarily pre-supposes that the means of fabrication, the capability of employing whatever materials may be judged suitable, and the selection of such process as may be the most economical, are entirely subject to the will and judgment of the individual.

None of these elements of rational and honest competition are available for the pharmaceutist. The composition of medicines is regulated by the codex. The pharmaceutist must conform to its directions not only in regard to the quality, number, and quantity of substances which he employs, but likewise with regard to the process for making them. It is, therefore, physically impossible that he can effect any licit or avowable saving in their fabrication. This necessity of conforming to the codex excludes any idea of alteration, and likewise excludes any idea of improvement which the pharmaceutist might otherwise put forward as a plea to his customers for such alteration. Perfection for him in the practice of his art consists in strict adherence to the directions of the codex, in the fulfilment without parsimony and with absolute exactitude the prescription of the medical man. There is no possibility, as in ordinary industrial pursuits, of increasing the sale of his products, or of forcing their consumption by taking advantage of the appetite for cheapness, and compensating for the small profit by a larger return.

It may be easily understood that the cheapness of any commodity increases its consumption; that it may be a reason for applying it to a greater number of purposes, or for its use by a greater number of persons; but the cheapness of a medicine will never be a sufficient attraction to induce persons to make use of it except in cases of strict necessity. The most valuable medicines might be offered gratuitously without a grain more being consumed. The pharmaceutist has not even a right to sell his goods to any one who may wish to buy them; he dares not do so without the authority of a physician's prescription.

In the duties attached to such a profession it is impossible to recognize any circumstance which resembles the conditions under which ordinary industry is exercised, nothing which could suggest the application of the same principles.

We have examined free competition only with regard to the advantages which are attributed to it. It presents likewise certain inconveniences which are inseparable from it. There can be no doubt that reduction of price is an inevitable consequence of competition, that this reduction necessarily causes a deterioration in the quality of commodities, and that it is the most efficacious cause of all the frauds and adulterations which are practised in commerce. It is true that these frauds, though culpable in a moral point of view, are not always of great importance to the buyer; when practised upon materials of clothing and general manufacture, the difference is merely in the durability or the intrinsic value of the article, a difference which may perhaps be compensated for, wholly or in part, by the cheapness. But when the fraud is practised upon alimentary substances, and above all upon medicines, in which latter moreover it is as difficult to recognize adulteration as it is easy to practise it, the subject acquires a gravity which will not admit of any compensation; it is the duty of the Government to take every means for its prevention.

Matters of industry and commerce are, in fact, matters of money; those which relate to the sale of medicines are of importance to the public more in regard to health and life than pecuniarily.

The Prussian legislature, by rendering in pharmacy the commercial question subordinate to the medical, by preventing competition, which inevitably leads to the sale of bad medicines, by regulating for the sick the price of drugs whose value or quality they are ignorant of, contributes more effectually to the true interests of the public than if it had allowed the practice of pharmacy to be governed by the principle of unrestricted freedom.

THE MANAGEMENT OF PHARMACEUTICAL ESTABLISHMENTS.

It would be very far from the truth to suppose that the system upon which pharmacy is carried on in Germany in any way tends to diminish the spirit of emulation among the pharmaceutists of that country, to introduce negligence in the management of their business, or to lower the character of the educational studies.

With regard to the general manner in which the business is conducted, it is difficult, except from actual inspection, to form any conception of the order, quiet and regularity which are maintained in a German pharmaceutist's shop. These establishments

never presents that superfluity of exterior decoration which in other countries fixes the attention of the passers; a simple inscription, sometimes, perhaps, a sign placed over the entrance, scarcely distinguishes the pharmacy from the neighboring dwelling-houses; within all is quiet and orderly, as is accordant with the nature of the business. Several assistants are engaged in the preparation of medicines, one person only, and most frequently the principal, being engaged with the customers; he receives the prescriptions and distributes them among the assistants for preparation. When the medicines are completed, they are examined by the principal, to ascertain whether they agree with the prescriptions. In many shops the customers are not admitted into the place where the medicines are prepared, but remain in a kind of ante-room or vestibule. In the less extensive establishments there is always a small space, a kind of office, reserved for the preparation of medicines. The pharmaceutist is compelled by the regulations to write upon each label the name of the person, the date, and the mode of administering the medicine. In some States it is customary to make use of colored labels for external applications, so as to make a more marked distinction between them and others, than is effected by a written label.

As the pharmaceutists in Germany are required to prepare the greater part of the substances sold by them, and as most of the pharmaceutical establishments in large towns are on a very extensive scale, they are provided with well arranged laboratories, in which steam is very ingeniously employed as a source of heat for the preparation of infusions, decoctions, distilled waters and extracts, for evaporation, and in short all the operations which require the aid of a moderately elevated temperature. These laboratories likewise contain very efficient chemical and mechanical apparatus.

The difficulty of creating new establishments prevents many men of experience from meeting with suitable positions as principals, and this circumstance likewise ensures the capability of the assistants in the pharmacies.

INSPECTION OF PHARMACEUTICAL ESTABLISHMENTS.

The inspection of pharmacies is provided for by the Prussian law; each one must be visited at least once every three years, and more frequently if the inspectors should think it requisite.

The visits of inspection are made in the presence of the "kreis physicus," by one or more pharmaceutists generally selected for the office from some other neighborhood.

The pharmaceutist whose shop is inspected is bound to submit to the inspectors his concession, his diploma, the legal pharmacopœia, the tariff of medicines, the regulations referring to the exercise of the business, together with the most recent alterations which have been made, further the journal of the laboratory work, an account of poisons sold, an herbarium of indigenous officinal plants, and a packet of prescriptions with the prices of the medicines affixed. The assistants are required to produce their certificates of apprenticeship, to answer questions relating to pharmacy or chemistry, and to explain a passage in the Pharmacopœia. The apprentices are also examined, with a view to ascertain their capacity and acquirements, due allowance being made for the length of time they have been receiving instruction.

These visits or inspections generally occupy several days, and it will readily be understood that they require some time. In addition to the above-mentioned particulars, the whole of the medicines included in the tariff are submitted to chemical examination by the inspectors, who carry with them the requisite chemical re-agents. The pharmaceutist has to pay about six shillings for the cost of re-agents, and has, moreover, to bear the expense of the extraordinary visits which the inspectors may think fit to make. Minutes of the inspection are taken and transmitted to the "medicinal rath," whose duty it is to institute proceedings against such pharmaceutists as may be found to have infringed the law—a circumstance, however, which very rarely occurs. In any case the "medicinal rath" addresses to the pharmaceutist who has been visited an official letter, containing a résumé of the report made to him, adding at the same time any remarks of compliment, advice or reprimand, which he may consider necessary.

The reports made by the inspectors are sometimes very minute, and show how far the examination has extended, and the degree of care with which it has been executed. The following is an extract from the official letter, addressed by the "medicinal rath" to a pharmaceutist on the occasion of an inspection of his shop:

"The concentrated sulphuric acid had a density of only 1·832; the extract of belladonna was not entirely soluble in water; the hydrated peroxide of iron contained a small quantity of chlorine; the iodide of potassium contained a trace of iodate; the loft appropriated to the drying of plants is not sufficiently ventilated, it requires an additional window; the herbarium is not kept and arranged in a proper manner; the inspectors have not found the Military Pharmacopœia in your shop; your apprentice does not possess a sufficient knowledge of the Latin language—you should pay attention to his improvement in this respect," &c.

These passages will be sufficient to give an idea of the attention which is directed by the inspectors, not only to the nature of the medicines themselves, but also to everything relating to the good management of the business.

The regulations laid down by the Prussian laws for the inspection of pharmacies, are, upon the whole, analogous to those observed in France, but there are some peculiarities in the practical details which are deserving of notice.

The French law makes no mention of anything besides the examination of medicines, omitting altogether the pupils, the general state and management of the shop and laboratory.

The establishment of an herbarium in each pharmacy would be very desirable in France, inasmuch as it would encourage the study of botany by the pupils, a subject which is now too much neglected. It would, moreover, be of practical utility. A well arranged herbarium of officinal plants would very frequently be of service to the pharmaceutist in ascertaining, by comparison, whether the drugs obtained in commerce are really the true species.

The most important of all the provisions of the Prussian law relating to the inspection of pharmacies, is, without doubt, that which empowers the medical legislative authorities to address to the pharmaceutists such observations as they may deem necessary from the result of the inspection. Commendation or censure thus officially expressed by a superior and competent authority, perfectly well informed as to the particulars of the case, are far more effectual means of keeping the pharmaceutists in the faithful exercise of their duties, than an inflexible law which would leave to the inspectors only the choice of one or other

penalty, and would admit of no intermediate course between a tacit approbation and a legal prosecution. There are, however, a multitude of circumstances relating to the management of a pharmacy, or the quality of medicines, which may call for notice, instances of involuntary negligence, which, if tolerated, might ultimately prove injurious to the public, although not of sufficient gravity to justify the institution of legal proceedings against the pharmaceutist. Admonition is, indeed, sometimes given by the inspectors themselves; but being merely verbal, and wanting in any kind of legal recognition, is not so likely to produce the desired effect.

SECRET REMEDIES.

After what has already been said, it is scarcely necessary to state that the pharmaceutists of Germany are interdicted from selling or announcing for sale any secret remedy; nevertheless they sometimes furnish these remedies on the authority of a physician's prescription.

In France the law with regard to this point is the same, but it is not carried into effect. A decree of the 18th of August, 1810, prescribed the conditions which were to be observed in making known the formulæ for new and useful remedies. But the wise provisions of this decree have not been taken advantage of. Instead of following them out in their strictest sense, the legislature has reserved the dangerous right of granting to certain inventors an authority to vend and advertise their medicines. The granting of these privileges, to which is attached a pecuniary consideration, far greater than that of a pharmaceutical concession in Germany, is not subject to any conditions. Neither the medical collegiate bodies nor the juries charged with the supervision of pharmaceutical affairs, are consulted on the occasion. And further, these privileges have the great objection of being unlimited in duration; so that, even at the present time, there are being sold, under the sanction and patronage of the government, the vilest compounds, which are both antiquated and inferior to any that can be prepared by a rational application of pharmaceutical knowledge, but which have acquired a certain *prestige* in the eyes of the vulgar, from the government sanction, and more especially from the mystery in which they are enveloped.

THE SALE OF POISONS.

The provisions made by the Prussian law for the sale of poisons, closely resemble those which obtain in France. They must be kept in separate closets, and not sold except under certain conditions, to persons free from suspicion, provided with a due authority, and for determinate purposes, under a penalty of 3000 francs. A poisonous substance, when sold by a pharmaceutist, must be enclosed in a box tied and sealed. On the exterior the name must be written in German or French, and Latin, according to the locality, with the addition of three crosses, or a label with a death's head.

In some States of Germany it is necessary, besides the above precautions, for the receiver of the poison to give a receipt, to which he affixes his seal, and running thus: "I the undersigned declare that I have received from the pharmacy of M. ———, (name and quantity of the poison,) packed according to the regulations, labelled and sealed (use to which it is to be applied); and I make myself accountable for any accident this drug may occasion."

THE DRUGGISTS.

The Druggists in Germany are not allowed to sell any compounded medicine, although they are at liberty to sell simple drugs. They may not sell medicinal drugs by retail.

It is impossible to fix rigorously the limit between retail and wholesale; and in order to obviate the difficulties to which such an uncertainty would give rise in practice, the government has published a list of the drugs which may be sold by Druggists in any quantities, and a list of those which must not be sold by them below a certain weight.

HOSPITALS.

With very few exceptions the medicines required for hospital use are prepared by the pharmaceutists of the town.

The larger hospital at Berlin is provided with medicines by the king's pharmaceutist, and they are prepared under the direction of M. Wittstock.

The prices of medicines for hospitals, or for charitable institutions, is based upon a tariff, upon which the contractor agrees to make a certain reduction. Very frequently the one who

makes the greatest reduction is chosen, but sometimes they are furnished successively by the several pharmaceutists of the town, and under the same conditions.

In the preparation of these medicines the legal pharmacopœia is generally followed; however, many hospitals and charitable institutions have particular formulæ; thus, for instance, there is a pharmacopœia for the paupers of Mayence, entitled, "Formulare Medicum pro pauperi Maguntinis."

Independently of these necessary and appropriate reductions, pharmaceutists are frequently required to make a reduction in their charge for medicines, upon the simple suggestion of the physician; who, for that purpose, writes upon the prescription, "PP., pro pauperi."

RÉSUMÉ.

It will be seen from the above account that Pharmacy in Germany is regulated by an essentially preventive legislation; it constitutes a species of organized public service, subject to the supervision of a minister and a special administrative body, who do not for an instant lose sight of the interests of the public in everything that relates to the preparation and sale of medicines. The two most important features of this organization, are, the limitation of the number of pharmacies, and the establishment of a fixed scale of prices for medicines. It is these two provisions, the latter of which is in truth but a consequence of the former, that peculiarly distinguish the Prussian pharmaceutical law from that of France.

The limitation of the number of pharmacies as it exists in Prussia, is not absolute. The government no longer grants exclusive privileges to pharmaceutists, but merely concessions, reserving at the same time the right of increasing their number to such an extent as the necessities of the population may demand.

Hitherto the government have exercised this right with extreme reserve, and in such a manner as to lead to the opinion that it is not their intention to increase the number of pharmacies. Moreover, as public opinion and custom are in favor of this limitation, things may remain for a long time in their present condition; but this *statu quo* is very probably the result of

habits acquired as a necessary consequence of the legislation relating to pharmacy.

It is very easy to perceive that a similar limitation with such a reserved power in the hands of the government, would, when adopted in a country governed by such principles of liberty as obtain in France, neither be attended with the dangers which are feared, nor with all the advantages which might be anticipated from it, for it would in reality be almost equivalent to a state of absolute liberty.

It would indeed be very difficult, not to say impossible, that any government left to its own free exercise, without any precise course of action laid down beforehand, without any administrative traditions with regard to the matter, could long offer any resistance to the solicitations of those who might demand the establishment of new pharmacies, or to the pressure of opinion, always disposed in France to the view that the public is interested in the extension of professions, and in competition between those who belong to them. In order that the limitation of the number of pharmacies in France should be attended with any serious results, especially if it was accompanied by the application of a tariff, it would be absolutely necessary not to leave the matter, as in Prussia, to the decision of an administrative body, but that the law itself should lay down, in a precise manner, the conditions of such limitation.

In regard to all points which do not directly relate to the limitation and the tariff, the provisions of the French and Prussian legislation differ but slightly. They both tend to the same object, and almost always by the same means. There is, however, a fundamental difference in the mode of their application; for, according to the Prussian system, the supervision being more complete, more constant, more comprehensively organized, the power of the administration being better established and more extended, it is possible to prevent the commission of many offences which it is necessary in France to refer to the legal tribunals.

But by instituting a legal prosecution against a pharmaceutist a severe blow is given to his reputation, and recourse cannot be had to such an extremity without some very efficient grounds; consequently, many circumstances which are not without some

importance, escape notice altogether, actually by reason of the severity of the law. If, however, there is any case in which it is more desirable to prevent offences than to punish, it is certainly the present one. It would, therefore, seem fit, to render the supervision of pharmacy more efficacious, to introduce into the measures adopted with this view consistency and completeness, to give to the body charged with this supervision a moral influence which it has never yet possessed, and a certain degree of authority which would in many cases obviate the necessity of having recourse to the legal tribunals.

Among the several points of detail which the exercise of pharmacy in Germany suggests, I will confine myself to mentioning those provisions whose introduction in France appears desirable, and which are, moreover, in accordance with the general spirit of of legislation in that country:

The separation of pupils into two classes, those properly so called, and assistants (aides); the administration of the oath under conditions which would render this simple formality a serious matter; the establishment of an inspection of pharmacies not only with regard to medicines, but likewise to the entire management of the business and the laboratory; to require each pharmaceutist to keep an herbarium of officinal and other plants used in medicine; that an abstract of the reports made to the authorities on the occasion of inspections, should be addressed in an official manner to each pharmaceutist, and that these reports should furnish an opportunity of direct communication between the administrative body and the pharmaceutists; the introduction of stricter regulations with regard to secret remedies; lastly, the introduction of written theses and chemical analyses into the examinations.—*Pharmaceutical Journal, from Journal de Pharmacie.*

ON THE OIL OF HOPS.

By Dr. Rudolph Wagner.

The ethereal oil of the female flowers of the hop plant (*Humulus lupulus*) is quite unknown with regard to its technical importance. A superficial examination by Payen and Chevallier has been the source of innumerable errors with reference to the

properties of oil of hops. It has been believed, in consequence of this examination, that the oil resembled oils of mustard, assafœtida, &c., and belonged to the ethereal oils containing sulphur; that it dissolved largely in water, and on this account preserved the beer, and that it acted partly as the narcotic ingredient of beer and of hops.

The following research conducted by me with oil carefully prepared by Hertel, shows that the deductions of Payen and Chevallier are incorrect. The oil was distilled from fresh hops with water, and constituted about 8 per cent. of the hops, which were dried in the air. It was of a clear brownish yellow color, possessed a strong odor of hops, and had a slightly bitter taste analogous to thyme and origanum. Its specific gravity was ·908 at 61° Fahr. It scarcely reddened litmus paper, which, when moistened with the oil and exposed to the atmosphere for a considerable time, assumed a decisive red color. A small quantity shaken with water dissolved in such a small degree that the water only had the odor of the oil. It requires more than 600 times its weight of water for its solution.

It was examined for the purpose of ascertaining whether it contained sulphur, but with a negative result. The oil rendered anhydrous by distillation over fused chloride of calcium, evaporates partly at a temperature below the boiling point of water. It begins to boil at 257°, the boiling then rises to 347°, where it remains stationary for some time, and at which nearly one-sixth of the oil distils over. The first distillate (A) was colorless, clear as water, and possessed a slight odor of hops, but more resembled rosemary. The portion (B) passing over between 347° and 437°, and constituting one-half of the oil, was also very clear, and had the odor of the crude oil. That which passed over between 437° and 455° was colored yellowish. The residue in the retort, about one-sixth of the oil, was brownish and like turpentine. It is, therefore, evident that oil of hops is a mixture of oils. The crude oil did not give, with an ammoniacal solution of silver, a metallic mirror. It is not, therefore, an aldehyde. When mixed with an alcoholic solution of potash the oil becomes brown, and by distillation the mixture affords alcohol and an oil with the odor of rosemary. After the greatest part of the oil and spirit has distilled over, a violent evolution of gas ensues, probably hydrogen,

and carbonate of potash remains, mixed with a potash salt of a volatile fatty acid. The odor which the acid evolves when set free from the potash with diluted sulphuric acid, leads to the conclusion that this acid is a mixture of caprylic and pelargonic acids.

The oil which passed over during this reaction, and resembles the previously mentioned one (A), boils between 347° and 356°, and has the formula C_5H_4. It, therefore, belongs to the large class of camphenes.

The portion B of the crude oil was subjected to fractional distillation, and the part which passed over at 410°, during which the thermometer was constant for a short time, consisted of $C_{20}H_{18}O_2$. This oxygenated oil is in the crude oil undergoing continuous oxidation, and dries, when exposed in a watch glass to the air, at last to a gummy mass.

This oil is isomeric with Borneo camphor, oils of cajeput and bergamot, and with the aldehyde of campholic acid $C_{20}H_{18}O_4$.

I have made, in conjunction with Dr. Bibra, researches on animals, to ascertain whether the oil of hops has a narcotic action, and find that it has no such action.—*Journal fur Pracktische Chemie, from Annals of Pharmacy, June*, 1853.

ON THE ESSENTIAL OIL OF LEMONS.

By John S. Cobb.

(Read before the Chemical Discussion Society.)

I have recently made some experiments with oil of lemons, of which the following is a short account:—

Being constantly annoyed by the deposit and alteration in my essence of lemons, I have tried various methods of remedying the inconvenience.

I first tried redistilling it, but besides the loss consequent on distilling small quantities, the flavor is thereby impaired. As the oil became brighter when heated, I anticipated that all its precipitable matter would be thrown down at a low temperature, and I applied a freezing mixture, keeping the oil at zero for some hours. No such change, however, took place.

The plan which I ultimately decided upon as the best which I had arrived at, was to shake up the oil with a little boiling water,

and to leave the water in the bottle; a mucilaginous preparation forms on the top of the water, and acquires a certain tenacity, so that the oil may be poured off to nearly the last, without disturbing the deposit. Perhaps cold water would answer equally well, were it carefully agitated with the oil and allowed some time to settle. A consideration of its origin and constitution, indeed, strengthens this opinion; for although ol. limonis is made both by distillation and expression, that which is usually found in commerce is made by removing the "flavedo" of lemons with a rasp and afterwards expressing it in a hair sack, allowing the filtrate to stand, that it may deposite some of its impurities, decanting and filtering. Thus obtained it still contains a certain amount of mucilaginous matter, which undergoes spontaneous decomposition, and thus (acting in short, as a ferment) accelerates a similar change in the oil itself. If this view of its decomposition be a correct one, we evidently, in removing this matter by means of the water, get rid of a great source of alteration, and attain the same result as we should by distillation, without its waste or deterioration in flavor.

I am, however, aware that some consider the deposit to be modified resin.* Some curious experiments of Saussure have shown that volatile oils absorb oxygen immediately they have been drawn from the plant, and are partially converted into a resin, which remains dissolved in the remainder of the essence.

He remarked that this property of absorbing oxygen gradually increases, until a maximum is attained, and again diminishes after a certain lapse of time. In the oil of lavender this maximum remained only seven days, during each of which it absorbed seven times its volume of oxygen. In the oil of lemons the maximum was not attained until at the end of the month; it then lasted twenty-six days, during each of which it absorbed twice its volume of oxygen. The oil of turpentine did not attain the maximum for five months, it then remained for one month, during which time it absorbed daily its own volume of oxygen.

It is the resin formed by the absorption of oxygen, and remain-

* The deposit is nearly insoluble in water, is acid and astringent to the taste, and gives an acid reaction with litmus. Spirit of wine dissolves out a small portion, which, on evaporation, leaves a thick oleo-resinous substance, having a rancid smell. Ether leaves a pleasant smelling resin, somewhat resembling camphor. The remainder is nearly insoluble in liq. ammoniæ, liq. potassæ, more soluble in nitric acid, and well deserves to be further examined.

ing dissolved in the essence, which destroys its original flavor. The oil of lemons presents a very great analogy with that of oil of turpentine, so far as regards its transformations, and its power of rotating a ray of polarized light. Authorities differ as regards this latter property. Pereira states that the oil of turpentine obtained by distillation with water, from American turpentine, has a molecular power of right-handed rotation, while the French oil of turpentine had a left-handed rotation. Oil of lemons rotates a ray of light to the right, but in France a distilled oil of lemons, sold as scouring drops for removing spots of grease, possesses quite the opposite power of rotation, and has lost all the peculiar flavor of the oil. Oil of lemons combines with hydrochloric acid to form an artificial camphor, just in the same manner as does oil of turpentine, but its atom is only one half that of the oil of turpentine The artificial camphor of oil of lemons is represented by the formula, C_{10} H_8 H Cl; the artificial camphor of oil of turpentine by, C_{20} H_{16}, H Cl.

According to M. Biot, the camphor formed by the oil of lemons does not exercise any action on polarized light, whilst the oil of lemons itself rotates a ray to the right. The camphor from oil of turpentine, on the contrary, does exercise on the polarized ray the same power as the oil possessed while in its isolated state, of rotating to the left. These molecular properties establish an essential difference between the oils of turpentine and lemons, and may serve to detect adulteration and fraud. It is also a curious fact, that from the decomposition of these artificial camphors by lime, volatile oils may be obtained by distillation, isomeric with the original oils from which the camphors were formed; but in neither case has the new product any action on polarized light.

In conclusion, I would recommend that this oil, as well as all other essential oils, be kept in a cool, dark place, where no very great changes of temperature occur.—*Annals of Pharm. Feb.* 1853.

ON THE PREPARATION OF TANNIC ACID.

On testing the method prescribed in the Prussian Pharmacopœia, for the preparation of tannic acid, Sandrock finds that it does not fulfil the desired object. In directing that water should be added to the ether employed, the authors of the Pharmacopœia

would appear to have aimed at an approximation to the method originally adopted by Pelouze, in which crude ether was used; and to have assumed that when watery ether is used, the lower layer of the percolated liquid is a solution of tannic acid in water. However, Mohr found that this is not the case, but that the lower layer is a solution of tannic acid in ether; and Sandrock has obtained the same result on repeating his experiments. The addition of water to the ether is, therefore useless, and moreover injurious, for the solution of tannic acid in ether is so thick that the percolation goes on very slowly, and sometimes stops altogether. The use of pure ether is open to the same objection.

The extraction of the tannic acid from galls may on the contrary be effected with ease by the crude ether, and on account of the small quantity of alcohol which it contains. The alcohol facilitates the percolation by rendering the solution of tannic acid less viscid.

Instead of crude ether a mixture of sixteen parts ether and one part alcohol may be used with equally satisfactory results. The percolated liquid separates into two layers. The lower one containing the tannic may easily be separated, and yields a perfectly pure product on evaporation. The upper layer contains the gallic acid, coloring matter, and some tannic acid.

When a mixture of eight parts ether and one part alcohol is employed, the percolate still separates into two layers, but the lower one is smaller than when the proportion of alcohol is less, and the upper layer contains a considerably larger quantity of tannic acid.

Finally, when a mixture of four parts ether and one part alcohol is employed, the percolate does not separate into two layers, and it is difficult to separate the tannic acid from the impurities with which it is mixed.

By means of the above process a much larger product of tannic acid may be obtained than with either pure or watery ether. The tannic acid remaining in the upper layer may likewise be obtained by evaporating the liquid to dryness, treating the residue with pure ether, until the lower of the two layers into which the liquid separates no longer presents a green color. It is then separated, filtered, if necessary a little alcohol added, and evaporated.

The process recommended by Mohr, of treating the galls with a mixture of alcohol and ether in equal volumes, than evaporating

the percolate which does not separate in layers, and regarding the residue as tannic acid, is altogether inadmissible, as it gives a very impure product.—*Pharm. Journ.* from *Archiv. der Pharmacie*, December, 1852.

NEW METHOD OF ANALYSIS FOR THE ORGANIC POISONS.

By C. Flandin.

The author commences by laying down the principles on which he supposes the action of poisons may be explained:—1. Poisons are unassimilable substances. 2. They pass into the organism by absorption. 3. Their action is that of presence.

If these principles be correct, it follows that all poisonous substances, *whatever they may be*, must be found in the organs with which they have been brought into contact, or to which they have been transported by absorption. In the case of the inorganic poisons, experience has shown that there is no exception to the rule. It still remains to be shown that the same rule applies to the organic poisons.

Christison states, with regard to opium, that as a general rule, the medical jurist can scarcely obtain satisfactory proof of the existence of this substance *by the best methods of analysis at present known*. Now the best methods of analysis known at present for ascertaining the presence of opium, and of the organic proximate principles in general, consist in treating the suspected substances either with acetic acid or alcohol, filtering the liquid, and evaporating it to the consistence of an extract. This extract is then re-dissolved in water, either pure or acidified, and decolorized by animal charcoal, or the animal matters are precipitated as far as possible by various reagents (such as subacetate of lead, sulphuretted hydrogen, nitrate of silver, &c.) Lastly, the extractive matter thus obtained is tested by different reagents, such as nitric acid and perchloride of iron, when it is desired to ascertain the presence of morphine, the active principle of opium. In this way, however, no satisfactory results can be obtained. The poison is not isolated; it is not directly acted upon by the reagents; its characteristic properties consequently cannot be ascertained.

The author considers that animal substances may be divided as follows:—1. Proteine or albuminous substances. 2. Coloring matter. 3. Fatty substances.

The proteine substances are readily coagulable, and in this state they become insoluble in water, alcohol, acids, &c.

The colored or coloring matters are easily changed by various acids and alkaline agents, anhydrous lime and baryta for instance, without mentioning heat.

The fatty substances are separated with ease from all the other matters by alcohol and ether.

Now if any inorganic substance be mixed with organic substances, there is nothing more easy than to discover it. The organic substance is burnt, the inorganic principle is brought to the state of a soluble compound within the cinder, and then extracted with water. The process of carbonization or incineration by means of sulphuric acid for the discovery of the mineral poisons is founded on these very simple data.

But if the substance which it is necessary to separate from animal matters be combustible, or capable of essential modification by heat, the course is not so clear. The following is the process proposed:—

To 100 parts of the substance to be examined, 12 parts of anhydrous lime or baryta are to be added, and the whole pounded together in a mortar. The mixture is then to be heated to 212° F., then pulverized, either with the pestle, or with a special apparatus appropriated to this operation, which is very essential; the powder is to be treated with boiling anhydrous alcohol three times, filtering the liquid after cooling. This liquid as it leaves the filter is scarcely colored; it only contains the proximate principle or principles sought for with the fatty or resinous matters.

The alcohol is now slowly evaporated, and the dry residue treated with ether to remove the fatty matters. If the principle be insoluble in ether (morphine, strychnine, brucine,) it will be separated in the fluid, and may be obtained by filtration or simple decantation. If it be soluble in ether, the alcoholic residue or the ethereal fluid must be treated with a special solvent of the organic bases, such as acetic acid, precipitating the base afterwards by ammonia.

To 100 grms. of animal matter, the author added a single grain or 0.05 grm. of morphine, strychnine and brucine; and by operating in the manner just described, succeeded in obtaining, in a state of absolute purity, a ponderable quantity of each of those principles. Instead of strychnine, morphine and brucine, the author

employed crude opium, laudanum, decoction of nux vomica and of false angustura bark; and in these cases also, he was able to isolate the poisonous principles. He also, in order to assure himself that his process was applicable to medico-legal purposes, poisoned animals with the smallest effective doses of the above-mentioned substances, when he was able to detect the poisons in the matters contained in the stomach and intestines, and sometimes even in organs to which they had been carried by absorption.

In one experiment, he mixed 2 grs. (or 10 centigrms.) of morphine with 100 grms. of flesh, leaving the substances to undergo putrefaction for two months. At the end of this period he discovered several centigrammes of morphine in the mass.—*Chemical Gazette*, from *Comptes Rendus*, March 21, 1853.

PERMANGANATE OF POTASH.

In consequence of the successful use of permanganate of potash in diabetes, under Mr. Sampson, the results of which have been lately published in the *Lancet*, and as it is probable that it will come into more general use, we think a short notice of it will be found useful to our readers.

This salt is formed by the mixture of peroxide of manganese with hydrate of potash; the resulting salt is, however, more abundant, if chlorate of potash be used in addition.

There are several modifications of the process: that of Chevillot and Edwards is to ignite one part of peroxide of manganese with one part of hydrate of potash, dissolve the resulting mass in water, decant the red solution and evaporate, rapidly at first, till small needles appear, then cautiously, that crystallization may go on regularly. Wöhler's (*Pogg.* xxvii., 626) process is as follows: chlorate of potash being kept in a state of fusion over a spirit lamp, hydrate of potash is first added to it, and then an excess of finely divided peroxide of manganese, which immediately dissolves, forming a splendid green solution. The mixture is then heated till the whole of the chlorate of potash is decomposed, and the mass when cold is boiled with a small quantity of water, whereupon the green color of the solution changes to red; finally, the liquid is decanted from the peroxide of manganese while still hot, and set aside to crystallize by cooling. It crystallizes in all proportions

with perchlorate of potash, with which it is isomorphous, the latter salt crysallizes in splendid red crystals, when a small quantity of permanganate of potash is added to its solution. With equal parts of the two salts, the crystals are nearly black.

Gregory's (*J. Pharm.* xxi., 312; also *Ann. Pharm.*, xv., 237) consists in adding to a finely divided mixture of eight parts of peroxide of manganese and seven parts of chlorate of potash, a solution of ten parts of hydrate of potash in a very small quantity of water, evaporating to dryness; igniting the finely-pounded mass in a platinum crucible over a spirit-lamp till the whole of the chlorate of potash is decomposed (for which a low red heat is sufficient,) and proceeding as described above. It is readily decomposed by organic matter, so that if it is required to filter the solution previous to crystallization, the neck of the funnel should be filled with asbestos.

The composition of permanganate of potash, according to Mitscherlich, is

	By calculation.		By experiment.
K O	47.2	29.65	30.385
$Mn_2 O_7$	112.0	70.35	69.580
KO $Mn_2 O_7$	159.2	100.00	99.065

The crystals are soluble in sixteen parts of water at 60°.

The dose generally found to agree best with the stomach is about three grains given in three or four tablespoonsful of water three times a day, a little before meals; much larger doses (as much as ten or twelve grains,) however, have been given, but the dose should be gradually increased.—*Pharm. Jour.*, July 1, 1853.

RESEARCHES UPON THE STRUCTURE OF GALLS.

By M. De Lacaze Duthiers.

The author commences by stating, that former writers upon the vegetable pathological productions, named galls, have only considered their forms, the plant upon which they are found, and the insects which cause them. Their structure and development have been completely neglected.

Galls are generally considered as purely cellular masses. This is an error, for they contain the principal elements and tissues which

enter into the composition of plants. They may be divided into external and internal galls, from their relations to the vegetable which bears them. The first project outwards, and are only connected with the plant by a very small peduncle; the second kind are developed within the tissues and organs they deform.

External galls are sufficiently naturally divided into unilocular and multilocular, from the number of cells which they contain.

The unilocular class may be divided into five groups, whose structure is more and more simple as it recedes from the first type This type is represented by the large gall of commerce and the French gall. If taken when fully developed, they exhibit from the surface to the centre,

1. Epidermis without stomata.

2. Cellular sub-epidermal layer, analogous to the cellular tissue of vegetables, containing coloring matter.

3. Zone of irregular ramose cells, with large cavities: the spongy layer.

4. Layer of hard, prismatic, dotted cells.

5. Layer of very thick, polyhedral cells, very hard, much dotted, and forming the protecting layer to the nucleus.

6. Central alimentary mass of soft cells filled with liquid, the external part containing starch-granules colorable by iodine, the internal not producing this reaction.

The central amylaceous mass disappears gradually during the developement of the larva, which does not commence its metamorphoses until it has consumed all the alimentary portion. May the most internal portion be regarded as fecula, modified by a process analogous to the commencement of digestion; or rather as matter more specially azotized, serving for the first phases of embryotic development? The French gall, like that of commerce, contains fibro-vascular bundles, which pass from the point of insertion towards the centre, and ramify in the interior of the parenchyma. We find in these bundles fibres, branching and dotted vessels, and true spiral vessels. These disappear successively and give the five groups of external unilocular galls before mentioned.

1. Hard and spongy. (French gall and gall of commerce.)
2. Hard. (Spherical galls on oak-leaves.)
3. Spongy. (Cellular oak-galls with regular tubercles.)
4. Cellular. (Lenticular galls on oak-leaves.)

5. Protecting layer disappears, the sub-epidermal cellular tissue only remains. (Spherical galls on briar.)

Compound or multilocular external galls are due—

1. To cohesion of simple tumors, allied to the fifth group described above. (Briar-gall.)

2. To the development of a hollowed cellular mass. They may be compared with different groups of the unilocular, being sometimes hard (tumors on roots of oak) or spongy (oak-apples.)

In all the external galls, whether simple or compound, the fibro-vascular bundles are placed on the outside of the protecting layer.

Internal galls are true or false.

True galls contain the insect in the interior of their tissues. They are hypertrophies, and have their seat upon all parts of the plant—on the parenchyma, the nerves, the petioles, the cellular tissues, cortical fibres, medullary rays, and the pith.

False galls are hypertrophies, deforming the organs and affording the insects protection and nourishment; but the parasites are always on the outside of the tissues of the plant. To this division belong the egg-masses of aphides, found on the leaves of the poplar, lime, elm, &c., and the nodosities of the trunk of the apple-tree.

The vegetable hypertrophy, in whatever form of gall it develops itself, does not cause the disappearance of any of the organic elements; it increases their number and volume, and modifies their form.

The *cause* of external galls is the deposite of a liquid venom with specific properties, a true morbid poison, secreted by the insect, which deposits it in the plant with its eggs. The form, consistence, &c., of the tumors, vary with the specific properties of the virus of which they are the consequences. Internal galls, and more especially the false, appear to owe their formation, as Reaumur has shown, to the abstraction of the liquids of the plant, by the suction of the aphides. This abstraction, in augmenting the vitality of the part, determines also its hypertrophied growth.

We could make a third general division, presenting at the same time the characters of external and internal productions; *e. g.* artichoke galls.—*Transactions of Phytological Club, in Pharm. Jour.*, July 1, 1853.

OBSERVATIONS ON QUINIDINE.

By Guibourt and Bussy.

From the experiments of these two chemists, it would appear that quinine and quinidine, whatever may be their atomic composition, and which is by no means definitely fixed, are two distinct alkaloids, and possessed of different chemical and physical properties.

1st. Quinine separates from its hydro-alcoholic solution in the form of a liquid of a syrupy appearance, which preserves its transparency on drying in the air. However, when it is spread in a very thin layer on glass, it becomes opaque, taking a very fine and indeterminate crystalline structure. In the first state, the quinine appears to contain 3 equivalents of water, or 14.29 per cent.; in the second state, it contains only 1 equivalent, or 5.26 per cent., the equivalent of quinine being equal to $C_{20}\ H_{12}\ N\ O_2$.

Quinidine separates from its hydro-alcoholic solutions in the form of crystals, which belong, according to the authors, to the system of the rectangular or rhomboidal prism. These crystals appear to be anhydrous, for they do not sensibly lose weight at a temperature of 212° Fahr.

2nd. Quinine is soluble in every proportion in cold ether and absolute alcohol, and almost in every proportion in alcohol of 90°. Quinidine requires 140 to 150 parts of cold ether, 45 parts of absolute alcohol, and 105 parts of alcohol of 90° to dissolve it; it is soluble in 3.7 parts of boiling absolute alcohol.

3rd. Crystallized sulphate of quinine (bi-basic, according to Leibig; neutral, according to Regnault,) is soluble in 57 parts of cold absolute alcohol, and in 63 parts of alcohol of 90°.

The corresponding sulphate of quinidine is soluble in 30 to 32 parts of absolute alcohol, and in 7 parts of alcohol of 90°.

4th. Sulphate of quinine is soluble in 265 parts of cold, and in 24 parts of boiling water.

According to Mr. Howard, the sulphate of quinidine is soluble in 73 parts of cold, and in 4.20 of boiling water. According to M. Leers, this salt is soluble only in 130 parts of cold, and in 16 parts of boiling water. (These great differences may be accounted for by the different mode of operating. Mr. Howard, for example, judges of its solubility in cold water, by the quantity of the salt

which remained from the cooling of a boiling solution. M. Leers probably treated the sulphate directly with cold water.)

5th. The oxalate of quinine is completely insoluble in water.

The oxalate of quinidine is very soluble, and crystallizes readily by the cooling or the evaporation of the liquor. Want of material prevented the further investigation of this substance.—*Annals of Pharm.* from *Journ. de Pharmacie.*

SINGULAR CHANGE IN THE SYRUP OF PROTONITRATE OF IRON.

By W. Tozier.

About twelve months since, I prepared a pint of this syrup according to the formula of Mr. Procter, in the "American Journal of Pharmacy," which possessed the different qualities he there describes of its excellence. Not being in immediate use, it was laid aside in a cold situation for some time, during which it still retained its transparency, and showed no disposition whatever to change, at least so far as the iron salt was concerned. About two months since, my attention being directed to it, I was surprised to find deposited on the bottom of the bottle, a considerable deposit of white granular masses, which I at once determined to be grape sugar, and these I observed to continue increasing daily up to the present time, until the entire contents of the bottle became one concrete mass, in quantity much exceeding the original amount of sugar employed. In dissolving some of this granular mass in distilled water, and precipitating the iron by means of sesquicarbonate of ammonia, I was enabled by Dr. Donaldson's test, as well as Moore's potash test, to determine the correctness of my opinion in the first instance. This alteration, no doubt, occurred from the fact of the solution of protonitrate of iron being slightly acid, in the first instance, which appeared to be unavoidable during the process, and which, after some lapse of time, led to the same molecular conversion of cane sugar into grape sugar, that sulphuric acid, as well as organic acids, are known to do.—*Annals of Pharmacy, April*, 1853.

Varieties.

Notes on the Almaden Mine, California, in a letter from T. S. Hart, dated San José, Nov. 26th, 1852.—We left San José at 8 o'clock in the morning in a stage which plies daily, and after a ride of an hour and a half over a most excellent road and through as beautiful and fertile a valley as the eye ever beheld, we arrived at the beautiful village of Almaden, distant twelve miles from San José. It is situated on the bank of a small stream of the purest water I have seen in California.

There is an excellent soda spring in the midst of the village, the water of which is considered as good as the Congress or Saratoga water. There is a large bakery near it, and they use the water in mixing up their bread, and certainly make as fine bread as I have ever eaten.

The works are much more extensive than I expected to find them. We called upon the superintendent, Mr. John Young, who treated us very courteously. The buildings are nearly all new, the old ones having been mostly removed. The loads of ore are brought down by the road to a level with the top of the furnace where it is separated into coarser and finer pieces. The process of extracting the metal from the ore is very simple. The ore is placed in the furnaces, where a gentle and regular heat is applied. As it diffuses itself through the ore the quicksilver contained in it sublimes, and is afterwards condensed and falls by its own weight, trickles down and out at little pipes leading from the bottom of the chambers of the furnace, and empties into vessels so situated as to receive it. From these pipes we saw the quicksilver falling more or less rapidly in large drops. In one vessel there must have been from 15 to 20 gallons of quicksilver. Mr. Young informs me that they manufacture about 1000 flasks per month, each flask containing 75 pounds, making 75,000 pounds per month. The flasks are all of wrought iron. The time occupied in filling the furnace and extracting all the metal from a furnace full of ore is about one week. When this is accomplished, the furnace is opened that the mass of rock may be removed to make way for another batch of ore. When these ovens are first broken open they have to be very careful not to approach them too soon, as the air is charged with the quicksilver escaping in the form of vapor, and if a person breathes it he is sure to be salivated.

After examining the works and the different processes, we visited the mines, which are one and a fourth miles from the works. We procured an order from the superintendent for that purpose, as no person would be admitted without one. We started up a beautiful road cut in the side of the mountain, the road being about 25 feet wide, and rising on an angle of about 20 (?) degrees. About half way up we came to a locality of sulphate of lime, from which some fine specimens have been taken. (I also found some specimens of fluor spar and chalcedony near the soda spring.) After

a fatiguing journey we reached the entrance to the mine, and handing our order for admission to the manager, who appeared to be a very gentlemanly man, we were furnished with a guide. We entered a car which was pushed by our guide into the tunnel, which is a most substantial and masterly piece of workmanship, being arched over in a most thorough manner; it is about 900 feet in length, 10 feet wide, and 10 feet high, with a railroad extending the entire length. The tunnel is some 300 feet below the former outlet near the top of the mountain. We were now each furnished with a torch with which each must enlighten his own way. We were now in the bowels of the mountain, with 350 feet of earth over our heads. The mouth of the tunnel did not appear as large as a man's head.

We soon commenced our exploration from chamber to chamber, which appeared to extend in a most intricate manner in almost every direction. Sometimes we descended a pole almost perpendicular for fifty feet, with merely little notches cut for the toes, and at other times ascended them. We finally came where the miners were at work; we heard the ringing of the drills and the strokes of the hammer, and on approaching nearer we could hear the measured groan or grunt with which they accompany each stroke that they make, and when I was convinced that it did not indicate pain, as its doleful sound led me to think, it became so ludicrous that I burst out into a hearty laugh. The miners are all Mexicans, and have been brought up to it from their infancy. Here was the richest *lead* they had in the mine; I obtained a number of specimens from it. They estimate that the chambers or avenues in a continuous line would extend a mile and a quarter; several have been abandoned on account of the danger of working in them.

We finally ascended to the upper outlet, or that which was first executed by the Indians, who must have begun at a very early date, as they had penetrated the mountain more than sixty feet, which must have been a most arduous task with the rude stone implements they worked with. They sought the vermillion to paint themselves with. They must at times have met with terrible catastrophes; one chamber was pointed out which contained a large amount of human bones buried beneath the rock which had evidently caved in upon them where they had made their excavations too wide. Having got out into daylight once more, we found ourselves near the top of the mountain, the view from which repaid us richly for our laborious ascent. There was spread out before us a vast extent of country, including the whole range of the valley of San José, and the bay with the land bordering it on either side, as far up as San Francisco on the west, and a point opposite to it on the east. Twelve miles from us on the plain was the town of San José, a little to the left the town of Santa Clara, and still further on the village of Alviso, and the Mission of San José on the table land in the distance. This country is so rich and fertile that when its agricultural merits are fully developed and brought to bear, it will feed and maintain all the population of California.—*Silliman's Journal, July*, 1853.

On the Growth of Plants in Closely Glazed Cases. By N. B. WARD, F. R. S., &c. Second edition. London: Van Voorst, 1852. pp. 143, 12mo. —The first edition of this little treatise, published in 1842, is doubtless well known to many of our readers; and some may remember Mr. Ward's original account of his interesting discovery of a method of growing every sort of plant in the dun atmosphere of the smokiest part of London, published in the Companion to the Botanical Magazine in 1836. This new edition if reduced in size is increased in interest, and is embellished with tasteful illustrations on wood, several of them exhibiting approved forms of those glazed cases with which the name of our author is inseparably connected. The first chapter, on the natural conditions of plants, their relations to heat, light and moisture, and the necessity of attending to the particular conditions or combination of circumstances, under which each species flourishes, is illustrated by ingenious and often novel observations. The second chapter treats of the causes which interfere with the natural conditions of plants in large towns, and gives some idea of the obstacles which prevent the cultivation of even ordinary plants in the open air in London, and to some extent in other large British towns. The third, on the imitation of the natural conditions of plants in closely glazed cases, tells us how a simple incident (the accidental growth of a seedling fern and a grass in a glass bottle, in which the chrysalis of a Sphinx had been buried in some moist mould), carefully and wisely reflected on, taught Mr. Ward how to overcome these obstacles, and thus to surround himself with his favorite plants, in beautiful vegetation, while living in one of the murkiest parts of London, and even to grow with complete success such ferns as the *Trichomanes radicans*, which is utterly uncultivatable in any other way. A fourth chapter treats of the conveyance of living plants on shipboard; which brings to view one of the most important practical applications of Mr. Ward's discovery.

Sir William Hooker states that "the *Wardian cases* have been the means, in the last fifteen years, of introducing more new and valuable plants to our gardens than were imported during the preceding century; and in the character of domestic green-houses—that is, as a means of cultivating plants with success in our parlors, our halls and our drawing-rooms, they have constituted a new era in horticulture." Formerly only one plant in a thousand survived the voyage from China to England. Recently, availing himself of our author's discovery, Mr. Fortune planted 250 species of plants in these cases in China, and landed 215 of them in England alive and healthful! The same person lately conveyed in this way 20,000 growing tea-plants, in safety and high health, from Shanghae to the Himalayas. In fact this mode of conveyance is now so universally adopted, and has proved so successful, whenever properly managed, that it is no exaggeration to say that, probably, "there is not a single portion of the civilized world which has not been more or less benefitted by the invention." An indispensable requisite to success in the transmission of living plants by this method is, that the glazed cases should be freely exposed to light. Where this cannot be done, we must be

content with the former method, of conveying plants in a passive condition, closely packed in peat-moss,—a plan, however, which is only partially successful in protracted voyages. Two additional and highly interesting chapters treat of the application of the "closed" plan in improving the condition of the poor; and on its probable future applications in comparative researches in vegetable physiology, and even in the treatment of diseases. To these, as to the other topics of this work, no justice can be rendered to our author's suggestions except by lengthened quotations, which the nature of this notice does not admit of. It must suffice to direct attention to this fascinating little volume. Those who read it and who have a true fondness for growing plants, will scarcely be contented without a Ward case, of more or less pretension, which they will find an unfailing source of interest, especially during the long and total suspension of vegetation in our protracted winters. With proper management, and with the requisite amount of light, any plant may thus be cultivated. But we particularly recommend Ferns and *Lycopodia*, of the most delicate kinds, as requiring least care, and as making the prettiest appearance at all seasons. Most of these require little light; although our clear skies afford us this in abundance. So little bituminous coal is consumed, even in our largest cities, that the "fuliginous matter" with which all British towns are begrimmed and rendered noxious to vegetation, here interposes no obstacle to rearing plants. Quite unlike England, the principle obstacle to the growth of delicate plants in our houses in winter, and in our grounds in summer, comes from the dryness of the air. For this, the Ward case affords a perfect remedy; as nothing is easier than to furnish a saturated atmosphere for those plants that require it, or to supply and retain the degree of moisture which suits any particular species.—A. G.—*Silliman's Journal, July*, 1853.

Method of obtaining positive Photographic Impressions directly upon Plates of any description, especially on those intended for Engraving. By A. Martin.—The method employed by the author is the same as that which he described for taking positive pictures on glass. The metallic plate, covered in the usual manner (but upon both sides) with etching-ground, is first coated with iodized collodion, then dipped in the solution of nitrate of silver, &c. The picture, when taken, is freed from the unmodified iodide of silver by the bath of cyanide of silver, washed with water, immersed in a solution of dextrine, and dried. The engraver may then make the same use of the design that he does of the outline, which is usually transferred to the etching-ground. A second impression on glass will preserve the design, which the operation of engraving will destroy upon the plate.

Impressions taken in this way upon varnished metallic plates of any kind, or even upon cardboard, unite with the qualities of positive impressions upon glass, a strength and facility of transport of which the latter are deficient. The method is also applicable to wood blocks.—*Chemical Gazette, from Comptes Rendus*, April 18, 1853.

Analysis of Opium.—Professor Sacc, with a view of preventing the increasing adulteration of opium, proposes the following method of analysis: The opium is to be cut in thin slices and digested with ten times its weight of water, and then filtered through muslin. The solution is to be exactly neutralized with ammonia; precipitated by chloride of calcium and the meconate of lime separated by filtration. The filtered liquor has an excess of ammonia added, is boiled and again filtered; the residue on the filter is impure morphia, and readily indicates the value of the opium. The mother liquor is treated with carbonate of ammonia, to separate the lime, boiled, filtered, evaporated to a syrupy consistence and digested with absolute alcohol, which dissolves the narceia and any meconia, leaving an insoluble residue of gum and caoutchouc. That portion of the opium insoluble in the water, on boiling with absolute alcohol, gives up its narcotine.—*Bull. de la Soc. des Scien. Nat. de Neufchatel, V. 2me.*

Extracted Cantharides.—M. Wald, in speaking of cantharidal collodion, mentions, that in consequence of frequent complaints of the inefficacy of this vesicant, he has ascertained by examination that packages of cantharides from Italy and Hungary contain insects, most of which had been used in the preparation of cantharidin, this having been extracted by ether. The fraud is not readily detected, as the cantharides acted on cannot be distinguished from the others with which they are mixed.—*Idem.*

Method of detecting Alcohol in Ethereal Oils. By A. Oberdorffer.—From two to four drachms of the oil to be examined are poured into a flat glass plate, in the middle of which is placed a small glass stand (the inverted neck of a six-ounce bottle is very suitable for this purpose) on which a watch glass, with five to ten grains of platinum black, is supported, and the whole covered with a glass bell open at the top. After a strip of moistened litmus paper has been laid over the vessel, containing the platinum black, the operator observes the reaction.

In the course of a few minutes, oil, containing alcohol, begins to redden the litmus paper, which, in the space of a quarter or half an hour, is completely accomplished; upon which, the eliminated vapor of acetic acid is deposited on the interior of the glass bell if the alcohol was present in sufficient quantity, and can be recognized distinctly by its odor. To remove all doubt, the author washes the platinum black, after an hour has elapsed, with a little water, filters, saturates the filtrate carefully with potash, and adds neutral chloride of iron, by which the characteristic color of acetate of iron is obtained; and, after boiling, the fluid becomes decolorized, and the hydrate oxide of iron is precipitated.

From a series of experiments, the author concludes that it is possible, in this way, to detect the presence of 1 to 2 per cent. of alcohol, and that with 5 per cent. the odor is sufficient, with most oils, to prove the admixture of alcohol. How far this method may be interfered with, by some oils which

have very acid reactions, or particularly pungent odors, experience must teach; but with a great number of oils, it has been found available, even with oil of bitter almonds.—*London Ann. of Pharm.*, from *Archives der Pharm.*

The presence of Hydro-Sulphocyanic Acid in Commercial Ammonia.—Mazade has found hydro-sulphocyanate of ammonia in the ammonia obtained from the gas works at Saint Etienne. The red color which arises from the combination of this ammonia with acids proceeds from the action of the hydro-sulphocyanic acid on the iron contained in the acids and in the ammonia. Pelouze has recorded that Moreau detected hydro-sulphocyanate of ammonia amongst the products of the distillation of coal, and that the red color which alum, prepared with sulphate of ammonia from gas works, exhibits, results from this salt.—*London Annals of Pharm.*, from *Comptes Rendus.*

A Delicate Test for Iodine. By Dr. A. Overbeck.—Comparative experiments have convinced me that the following method for detecting iodine is the most delicate of any yet known:

Some starch or sugar is poured into a test tube with concentrated nitric acid, and heated over a spirit lamp very gently until a violent evolution of gas ensues. The spirit lamp is then removed, and the gas, which now evolves without a continuation of the application of heat, is conducted into the fluid to be tested, to which a solution of starch has been added. If the fluid contains only a millionth of iodide of potassium, a blue coloration directly results. By a farther introduction of the gas, the iodide of starch precipitates out in flocks, and deposits itself, when at rest, as a compact massy precipitate. In this way I have found iodine in many plants, particularly in the ashes of several ranunculuses.—*London Annals of Pharm.*, from *Archives der Pharmacie.*

Purification of Tallow and Grease.—Mr. Wiggin, of Ipswich, explained to the meeting a process which he has recently patented, for melting and purifying tallow and other kinds of grease. The process consisted in heating the fatty substance in the state in which it is removed from the animal, with a small quantity of sulphuric acid of sp. gr. 1.3 to 1.45. The acid dissolves the membrane and other impurities present, acquiring a dark color and thick syrupy consistence, while the fat separates in a state of great purity. Some samples, which were shown to the meeting, of tallow and also of lard which had been prepared by this process, were whiter and more free from flavor than those prepared in the usual way.

In the discussion which ensued, it was suggested that the fats obtained by this process were probably the fatty acids resulting from the decomposition of the neutral fats by the oil of vitriol; but Mr. Wiggin stated, that in using the sulphuric acid at the density indicated no decomposition of the fats was effected, and that no sulphurous acid was evolved in the process.—*Pharm. Journ.*, May 1, 1853.

Hydrate of Magnesia as an Antidote in Poisoning.—Schuchardt represents as the result of his experiments, that hydrate of magnesia is a certain antidote, not only for arsenious acid, either in solution or substance, but also for corrosive sublimate, for the salts of copper, and even, although the experiments in this respect are not so satisfactory, for the alkaloids, such as morphia and brucia. The hydrate of magnesia may be prepared by mixing slightly calcined magnesia with water. In poisoning with arsenious acid the quantity of magnesia given as an antidote should exceed eight times the weight of the poison. For corrosive sublimate the antidote need not exceed five times the weight of the poison.—*Pharmaceutical Journal, from Journal de Pharmacie d'Anvers.*

Poisoning by Strychnia.—The following case, which recently occurred in the neighborhood of London, shows the importance of caution in the mode of ordering strong medicines in prescriptions, and also the necessity of attention to the dose in dispensing. It is not necessary to mention the names of the parties concerned. The prescription was as follows:

℞ Strychnos
Nucis Vomici, ℈ij.
Bismuth Trisnit., ʒiss.
M. ft. pulv. xxiv.

The prescription was prepared twice or three times at different shops correctly, and produced no bad effect; but on one occasion the young man put in strychnia and nux vomica, *of each* ℈ij. The patient took one dose, and very soon afterwards complained of some extraordinary sensations, and almost immediately expired. The accident arose from the fact that the word *strychnos* being written on a separate line, was considered by the dispenser to be another ingredient, instead of being as it was, the generic title of nux vomica. This would not have misled a young man qualified for his business, who considered for a moment the strength of the dose he was administering; but all young men not being so qualified and considerate, care should be taken in writing prescriptions to avoid any possible ambiguity.—*Pharmaceutical Journal, July*, 1853.

On the Purification of Sulphuric Acid from Nitric Acid. By M. Pelouze.—The fact that ammonia is capable, in virtue of the hydrogen which it contains, of decomposing the nitric acid and nitrous oxide present in sulphuric acid, may be taken advantage of for purifying sulphuric acid. These substances frequently present in sulphuric acid, are very detrimental in some cases—for example, in dyeing. By the use of a half per cent. of sulphate of ammonia, the most impure acid may be rendered perfectly free from these substances, and in the generality of instances, from one to two thousandths is quite sufficient. The salt should be introduced into the lead pans in which the sulphuric acid is concentrated.

It is the opinion of some that the injury suffered in the platinum vessels

used for the concentration, is owing to the presence of nitrogen compounds; and besides this, it appears that sulphuric acid containing nitric acid, is less suited to the purification of oils than pure acid.—*Pharmaceutical Journal, from Ann. de Chim. et de Phy.*, 3 ser. vol. 2, p. 47.

Crayons for Writing on Glass. By R. Brunnquell.—The author prepares crayons for writing on glass, so as to enable the contents of glass vessels to be described immediately upon them in the following manner: Four parts of spermaceti (or stearine), three parts of tallow, and two parts of wax are fused in a cup; six parts of minium and one part of potash are then stirred into it, the mass kept warm for half an hour, and then poured into glass tubes the thickness of a lead pencil. After rapid cooling, the mass may be screwed up and down in the tube, and cut to the finest point with a knife. A crayon is thus obtained which will readily write upon clean dry glass.—*Pharm. Journal, from Dingler's Polytech. Journal*, and *Chemical Gazette.*

Adulteration of Cassia Oil with Oil of Cloves. By G. L. Ulex.—This adulteration is as frequent as it is profitable. The specific gravity affords no indication of the purity of the oil, but there are other means of distinguishing between cassia and clove oil. When a drop of true cassia oil is heated on a watch-glass, it evolves a fragrant vapor, possessing but little acridity; when, however, clove oil is present, the vapor is very acrid and excites coughing.

Cassia oil, when treated with fuming nitric acid, does not present any intumescence, but crystallizes; when clove oil is present, it swells up, evolves a large quantity of red vapor, and yields a thick reddish-brown oil.

Cassia oil, treated with concentrated caustic potash, solidifies when pure, but not when mixed with clove oil.

One or two drops of true cassia oil dissolved in alcohol, give a pure brown color on the addition of protochloride of iron.

Fresh clove oil, treated in the same way, assumes an indigo blue color; older oil becomes green. Both colors are so intense that a twenty or thirty-fold volume of alcohol must be added before the liquid admits of the passage of light. In this reaction the protochloride of iron is reduced, and the clove oil is converted into a black resin, which separates.

Mixtures of cassia and clove oils treated with protochloride of iron, give an indefinite color between brown and green.—*Pharm. Journ. from Archiv der Pharmacie*, Jan. 7, 1853.

Test for the Purity of Ultramarine.—Dr. Bernheim proposes the following test for the examination of commercial ultramarine: Two ounces of sulphuric acid are diluted with twenty ounces of water; the samples of ultramarine introduced into separate test tubes in quantities of fifty or one hundred grains, and the acid added until the blue color is converted into a

reddish one. The quantity of acid used indicates the relative value of the ultramarine as a color. When smalt is present the color is not entirely destroyed, and chalk is recognizable by the effervescence.—*Pharm. Journal, from Kunth und Gewebeblatt fur Bayern*, 1853.

Red Ink.—C. Weber states that a very good red ink may be made in the following manner: Four ounces of Pernambuca wood are boiled with sixteen ounces of dilute acetic acid, and an equal quantity of water, until twenty-four ounces remain. An ounce of alum is then added, and the liquid evaporated to sixteen ounces, an ounce of gum arabic dissolved in it, the whole strained, and a drachm of protochloride of tin added to the cold liquid.

This ink possesses a very beautiful color, which is preferable to that of cochineal ink, from the fact that it is free from the blue tint of the latter, and further because it is more permanent.—*Pharm. Journal, from Allgemeine Pharmaceutische Zeitschrift.*

Tannate of Quinine.—The distinguished German pharmacologist, Buchner, long entertained the opinion that this preparation deserved the good opinion both of physicians and of pharmaceutists. He recommended the direct employment of the cinchona bark as the readiest means of procuring the tannate of quinine. His mode of preparing it was the following, and is, in fact, an extremely simple one: Cinchona bark, roughly powdered, is to be treated with six times its weight of common or household vinegar. After it has macerated during twenty-four hours, it is boiled, then decanted and the residue is treated afresh with more vinegar. These several decoctions are to be mixed together, and filtered when perfectly cold, and to them is to be added an infusion of gall-nuts so long as a precipitate is formed. This precipitate is to be collected on a filter, to be then washed, and lastly, to be carefully dried. Although the tannate of quinine prepared in this manner is not absolutely pure, and therefore requires to be given in larger doses than the sulphate of quinine, yet Buchner considered this preparation as particularly to be recommended, both on account of its cheapness in comparison with the more expensive drug, sulphate of quinine, and also from the simplicity of its manufacture, on account of the facility with which it may be prepared in almost all pharmaceutical establishments.—*Annals of Pharmacy*, June, 1853.

Means of preserving Paper Labels. By G. L. Ulex.—The labels upon vessels kept in damp cellars soon become obliterated in consequence of the paste becoming mouldy and the growth of a fungoid vegetation, which is at first sporadic, but gradually covers the entire label. If, however, a trace of the oxide of mercury is mixed with the paste, and the labels themselves are dipped into a very weak alcoholic solution of bichloride of mercury, their destruction in this way is completely prevented.—*Pharm. Journal, from Archiv der Pharmacie*, Jan. 1853.

On the Composition of Yeast Powder. By EDWARD N. KENT.—The following analysis was instituted for the purpose of ascertaining the composition of the yeast-powders which are now extensively sold by grocers.

Mixed with water, effervescence is produced by liberation of *carbonic acid.* A portion remains undissolved by *cold* water, which, when heated, forms a clear gelatinous mass, which becomes blue with the iodine test, *starch.* The portion soluble in cold water gives precipitates with salts of lime, characteristic of *tartaric acid;* and with chloride of platina gives *potash.* A portion of the original powder heated to redness, and treated with burning alcohol, gives yellow and violet flame, including *soda* and potash.

A quantitative analysis of the yeast powder gave the following results:

A portion treated with water, and the gas dried by chloride of calcium, gave ·085 carbonic acid.

A separate portion ignited, the residue treated with hydrochloric acid, and the alkaline chlorides thus formed separated by the double chloride of platina and sodium, gave ·137 potash, and ·096 soda.

Another portion treated with *cold* water gave ·227 starch.

The tartaric acid and water estimated as loss gave ·455. By calculation as cream of tartar, this leaves ·045 water in combination with the soda.

The carbonic acid formed, is in larger proportion to the soda than exists in the neutral carbonate, and in less proportion than exists in the bicarbonate, from which I infer that an intermediate carbonate, which is sold under the name of soda-salæratus, is used for the preparation of yeast-powder.

The per centage composition of the powder is:

Carbonic acid	·085		
Soda	·096	=22·6,	Soda-salæratus.
Water	·045		
Potash	·137		
Tartaric acid and water	·410	=54·7	cream of tartar.
Starch	·227	22·7	starch.
	1.000	100.	

SYNTHESIS.—Crystallized bitartrate of potash, powdered and sifted, is better than the same article which is sold in an impalpable powder, as cream of tartar, the latter being too fine, and consequently the gas is liberated too rapidly when mixed with water. Corn starch is more palatable than that from wheat, and consequently is the best. These articles mixed with soda-salæratus, in the above proportions, gives yeast powder identical with the one analyzed.—*New York Journ. Pharm.*, June, 1853.

An Account of a Deep-sea Sounding in 7706 *fathoms, in* 36° 49′ *South Latitude, and* 37° 6′ *West Longitude.* By Captain HENRY MANGLES DENHAM, R. N., F. R. S.—This sounding was obtained on a calm day, October 30, 1852, in the course of the passage of H. M. ship *Herald*, from Rio de Janeiro to the Cape of Good Hope. The sounding-line was 1-10th of an

inch in diameter, laid into one length, and weighing, when dry, 1 lb. for every hundred fathoms. Captain Denham received from Commodore McKeever, of the United States Navy, commanding the *Congress* frigate, a present of 15,000 fathoms of this line, 10,000 on one reel, and 5000 on another; and considers it to have been admirably adapted for the purpose for which it was made, and to which it was applied. The plummet weighed 9 lbs., and was 11·5 inches in length, and 1·7 inch in diameter. When 7706 fathoms had run off the reel, the sea-bottom was reached. Captain Denham states that Lieut. Hutcheson and himself, in separate boats, with their own hands, drew the plummet up 50 fathoms several times, and after it had renewed its descent, it stopped, on each occasion, abruptly, at the original mark to a fathom, and would not take another turn off the reel. The velocity with which the line ran out was as follows:

	h.	m.	s.
The first 1000 fathoms in	0	27	15
1000 to 2000 fathoms in	0	39	40
2000 to 3000 fathoms in	0	48	10
3000 to 4000 fathoms in	1	13	39
4000 to 5000 fathoms in	1	27	06
5000 to 6000 fathoms in	1	45	25
6000 to 7000 fathoms in	1	49	15
7000 to 7706 fathoms in	1	14	15
	9	34	45

The whole time, therefore, taken by the plummet, in descending through 7706 fathoms, or nearly 7·7 geographical miles of 60 to the degree, was 9h. 34m. 45s. The highest summits of the Himalaya, Dhawalagiri, and Kinchinginga, are little more than 28,000 feet, or 4·7 geographical miles, above the sea. The sea-bottom has, therefore, depths greatly exceeding the elevation of the highest pinnacle above its surface.

The strength of the line, tried before the sounding, was found to be equal to bear 72 lbs. in air. The 7706 fathoms which ran out, weighed, when dry, 77 lbs., exclusive of the plummet, 9 lbs. Great care was taken in the endeavor to bring the plummet again to the surface, to show the nature of the bottom, but, whilst carefully reeling in, the line broke at 140 fathoms below the water-line, carrying away a Six's thermometer which had been bent on at 3000 fathoms.—*Journ. of Frank. Inst.*, from *London, Edinburgh and Dublin Philosoph. Mag.* March, 1853.

On the Adulteration of the Citrate of Iron and Quinine of Commerce. By C. Greville Williams.—Physicians not yet being agreed as to the identity of action on the system of quinine and its accompanying alkaloids, it is unnecessary to insist on the fact, that until the question has been settled by decisive experiments, practitioners should be aware of the value of the preparations they are administering to their patients.

A quantity of beautifully "sealed" citrate of iron and quinine having been sent to me, with a request for examination, the percentage of quinine

being suspected to be below the proper quantity, it was examined thus:—100 grs. dissolved in the least possible quantity of distilled water, the solution filtered from a small quantity of dirt (!), the filter carefully washed, and the filtrate precipitated by a very small excess of ammonia. The precipitate was washed as much as was safe with water containing a little ammonia; it was then dried on the water-bath at 212°. After being exposed to this temperature for some time, it was observed that the precipitate, instead of melting to the paper as quinine does, remained in the form of a powder; it was therefore weighed, and found to be 10·4 grs.; on digestion in the cold with ether, this was reduced to 5·1. The portion dissolved proved on examination to be quinine; and the portion separated by the filter, as was suspected from its infusibility at 212°, turned out to be cinchonine.

The scales therefore consisted of—

Citrate of sesquioxide of iron and ammonia . .	89·6
Quinine	5·3
Cinchonine	5·1

The per-centage of quinine paid for by the pharmaceutist was 12.5 per cent.—*Chemical Gazette*, July, 1853.

Photography on Stone. By MM. Barreswil and Lemercier.—The process proposed by the authors, consists in preparing a negative on paper, and then producing a positive picture on lithographic stone. The negative is obtained by any method, the most rapid being preferable. The positive is produced by a fatty or resinous coating laid on the stone, and capable of being rendered soluble in some solvent by the action of light (and perhaps of oxygen.) The negative is laid upon the lithographic stone thus prepared, and covered with a glass plate; the whole is then exposed to the sun, the stone washed with the solvent, and then treated by the ordinary processes of lithography. The authors have hitherto employed asphaltum for coating the stone, and sulphuric ether as the solvent. They expect in this manner to reproduce engravings, lithographs, &c.—*Chemical Gazette*, from *Comptes Rendus*, May 16, 1853, p. 878.

On the Preparation of Lakes by means of Chloride of Antimony.—Chloride of antimony, which is to be met with in commerce under the name of *Liquor Stibii muriatici*, may, according to a recent observation of Prof. Lampadius, be very well employed in the preparation of several lakes. By dropping it into decoction of Pernambuco-wood, madder, Campeachy-wood, Quercitron-wood, and several other coloring matters, lakes, some of which are very fine, are produced.

From the infusion of cochineal in liquid ammonia, prepared in the cold, when a little pure vinegar is added to it, a large quantity of lake is obtained, which does not yield greatly in beauty to carmine.—*Chemical Gazette*, from *Schweiz. Gewerbeblatt*, vol. xi. p. 127.

Saccharate of Lime. By M. Trousseau.—The virtues of this preparation are due to the fact that sugar in solution is capable of absorbing a very large quantity of lime. The compound is made by saturating simple syrup with lime, and then filtering it. A perfectly transparent mixture is thus obtained, which is not troubled by admixture with water, and is characterized by an extremely alkaline taste. This syrup combining with water in any proportion, is a convenient and valuable mode of administering lime. The attention of physicians was first called to the article by Doctor Capitaine, adjunct to the Faculty of Medicine, and it was first employed by myself at the Necker hospital, in the treatment of the chronic diarrhœas of children. The dose for an infant is from a fourth to half a drachm, and for an adult, from one drachm to two and a half. At the Necker hospital, I was in the habit of mixing a small portion of this preparation with the milk allowed each suckling during the day, and it seemed to me to obviate the tendency of the milk to acidity in the stomach, and to prevent the disposition to diarrhœa so common in children of a certain age at particular seasons. In comparing the effects of the saccharate of lime with those of the bicarbonate of soda, I found the former to possess marked advantages.—*The Virginia Med. and Sur. Jour.* from *Trousseau, Traité de Thérapeutique.*

Dose for administration in cases of Poisoning, in which the Nature of the Poison is unknown.—After freely evacuating the stomach by emetics, the following formula, proposed by a pharmaceutist of Montpellier, may be prescribed.

℞. Calcined magnesia,
Pulverized charcoal,
Sesqui-oxide of iron,
} Equal parts in a sufficient quantity of water,

This preparation is perfectly innocuous, and is very likely to be efficacious, for its ingredients, though simple, are antidotes to the most active and commonest poisons.—*The Virginia Med. and Sur. Jour.* from *Bulletin de Thérapeutique.*

Process for Electro-Plating China Ware.—A specimen of china, coated with silver, was exhibited. Hitherto the art of electro-plating has been chiefly confined to metallic bodies, owing to their affinity for such deposits. The patent recently taken out by Mr. Ridgway, of the Staffordshire Potteries, extends it to Parian figures, ornamental china and glass, and to every description of Ceramic ware.

The advantages are manifold, when it is considered that this art may be applied to the most beautiful models, so as to retain all their sharpness and effect, without the cost of dies and other heavy charges to which the metallic department is subject, thereby cheapening the article; while, by means of chasing and embossing, richness is given.

The mode of effecting the electro-deposit is as follows:—In the first place, the articles are steeped in strong alcohol, or certain gelatinous solutions,

and when nearly dry immersed in nitrate of silver or otherwise, so as to prepare them for receiving the deposit of copper. This done, they are plunged into cold water, and carefully dried in a suitable kiln, after which they are placed in sawdust for twenty four hours to prevent oxidation.

The next operation is to remove any roughness on the surface which the articles may have contracted. This is done by means of sand paper or silver sand, and brushing with a scratch-brush till they are made perfectly smooth, care being taken to remove any greasy matter from the surface.

The copper and silver have now to form one alloy, so as to unite them firmly together. For this, a film of quicksilver is employed, dissolved in nitric acid. This is set aside to crystallize, and the crystals are dissolved to form the desired solution; the articles are then dipped therein, passed through water, and introduced into the vat containing the silver solution.

The silver solution consists of metallic silver dissolved in nitric acid diluted with water, with the addition of certain cyanides, till a given result is obtained. This is followed by a repetition of the copper process only with the solution, and the articles in due time appear in their silver garb, ready to receive the chasing.

Gold is prepared by being dissolved in nitro-muriatic acid. This chloride is digested with calcined magnesia, and the whole precipitated into an oxide. The oxide, boiled in strong nitric acid, dissolves the magnesia, and when washed forms a cyanide of gold and potassium.

The films of gold are deposited in the vessels by means of voltaic electricity, a process requiring careful observation, both to insure an adequate coating and the proper color; if defective, it will have to be repeated.

The time of exposure to the heat depends upon its intensity, and the color desired to be produced; these must be the fruits of experience, and will not fail to be acquired by practice.

The finishing process is the burnishing, which is the same as with the silver, and requires no further illustration.—*F. Inst. Jour.*, from *Journal of the Society of Arts.*

Metallic Cement.—According to Serbat, a metallic cement, which answers for all purposes and becomes hard in the heat, may be obtained in the following way:—100 parts of oxide of zinc, with the same quantity of sulphate of lead, are triturated with 30 parts of linseed oil, and then a mixture consisting of 100 parts of black oxide of manganese and 100 parts of peroxide of iron added until the mass forms a stiff dough. This is beaten in a mortar for twelve hours, during which the remainder of the above mixture of iron and manganese is added by degrees. The goodness of the cement may be recognized by its not crumbling when rolled out between the fingers.—*Annals of Pharmacy, July*, 1853, from *Le Génie Industriel.*

Electro-Telegraphic Development.—The extent of telegraphic communication completed and in operation throughout the world at the beginning of the present year may be estimated, as far as can be gathered from the returns, at

nearly 40,000 miles. Of this amount there were nearly 4000 miles in Great Britain, of which 100 miles only were underground, with about 400 or 500 miles in course of construction in England, Scotland and Ireland, and as many more projected. In America there were 20,000 miles of telegraph completed and in operation, with 10,000 more in process of construction, uniting in one great network the principal cities of the United States, the Atlantic and Pacific Oceans, and the extreme boundaries of that extensive continent. In Europe there were about 11,000 or 12,000 miles of telegraph in operation, and as many more projected or in progress. In Germany there were 3000 miles completed, in Austria 3000, and in Prussia between 3000 and 4000 miles. France, until lately in the rear of other nations, is now extending her telegraphic lines in all directions, her completed mileage at the present moment being small compared with that of other countries, her principal communications being those between London and Paris, Strasburg, and Marseilles. Russia has just commenced her system of telegraphs between St. Petersburg. Moscow, and Cracow, and the ports on the Baltic and Black Seas. In addition to her existing line between Naples and Gaeta, Italy is continuing the Neapolitan line from Terracina to Rome, so as to connect with the lines of Upper Italy. Denmark has about 400 miles of telegraph. Belgium 500, and the Netherlands line has just been completed from Amsterdam to the Hague. About 4000 miles are about to be constructed in India. Switzerland is introducing the instantaneous communicator, as well as other continental cities, so that the only unsupplied portions that will soon present themselves on a telegraphic map of the world will be Australia, Africa and China.—*Franklin Inst. Journ.*, from *London Mechanics' Magazine*,

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Fraudulent Substitution of Quinidin for Quinine.—Sir,—We think that a fraud is perpetrated with sulphate of quinidine, against which we think it right to put the trade on their guard. It has hitherto been sent out in a squat bottle with a red label and a seal, bearing our name and address, but without the name of the article. Certain parties have removed the red label, leaving the seal on, and then sold it as our sulphate of quinine. We beg, therefore, to call attention to the fact that our quinine in vials always bears a white label and a red seal, with *quininæ sulphas* engraved in the centre, and that in future our quinidin will bear a red label and a green seal, with "*sulphate of quinidin*" engraved in the centre. Against the fraud of retailing quinidin in small quantities as quinine, we believe there is no better security than testing it in any case of suspicion, with the ether and ammonia test, which has already appeared in your Journal. For this purpose, the following modifications will be found convenient: mix extra light ether and liq. ammon., P. L., of each a drachm, in a vial, and add six grains of the suspected salt, shaking the whole well together. The quinidine, if any be present, will remain undissolved in the form of a powder, more or less crystalline.

We are, Sir, yours very respectfully. Howards & Kent.

To the Editor of the Pharmaceutical Journal.

Stratford, near London, May 21, 1853. [*Phar. Jour.* June, 1853.

On White or Imperial Rhubarb. By Dr. G. Walpers.—In all works on Pharmacology there occurs a somewhat vague account of a very superior kind of rhubarb, said to be collected for the sole and particular use of the Imperial Court of St. Petersburg, and distinguished by the name of *White* or *Imperial Rhubarb* (*Radix Rhei alba seu imperialis.*) It is described as a rhubarb root in which the white portion so far predominates, that only a few red streaks are perceptible upon the surface of a transverse section. No one, however, is from personal knowledge acquainted with this species of rhubarb. In order to put an end to these doubts, I some time since addressed a letter to Mr. Büchner, chief Apothecary to the Imperial Court, begging him for a small specimen of this "*Imperial Rhubarb*" for my pharmacological collection, or should the communication of this precious drug be inadmissible, that I might at least have an authentic description of it. Mr. Büchner replied to this request with the utmost promptitude, informing me that, after having instituted the most careful inquiries, it appeared that no such species of rhubarb had at any time been imported for the Imperial family; that it had never occurred in commerce; and, finally, that in neither any public or private collection in St. Petersburg was there to be found a specimen of this (consequently mythical) root.—*Pharm. Journ.*, from *Bonplandia*, March, 1853.

[It was the Russian traveller Pallas who first drew attention to the so-called *White Rhubarb.* We extract from his works the passage relating to it: "J'ai vu pendant mon séjour à Kiakta des petits morceaux de rhubarbe blancs comme du lait. Elle est douce au goût, et a les mêmes propriétés que celle de la meilleure qualité. L'apothicaire se proposoit de trier tous ces morceaux, et de les envoyer séparément à Pétersbourg pour la pharmacie de la Cour."—*Voyages de M. P. S. Pallas, en différentes Provinces de l'Empire de Russie, et dans l'Asie Septentrionale, traduits de l'Allemand.* Paris, 4to, 1793, tome iv., p. 219.—Ed. *Ph. Journ.*]

Ointment of Mucuna Pruriens as a counter-irritant.—M. Blatin proposes (*Revue Médico-Chirurgicale*, Jan. 1853) the substitution of mucuna pruriens (cowhage) for tartar-emetic or croton-oil, as the active ingredient of ointments intended to act as cutaneous irritants. The proportions are, seven grains and a half of the hairs of cowhage to an ounce of lard. The ointment must be rubbed in from ten to twenty minutes; seven or eight grains are usually sufficient. The immediate effect is the production of a sensation resembling stinging with nettles; but the burning sensation and the itching diminish during the friction, and entirely pass off in less than half an hour. The skin generally becomes covered with white flat papulæ, which soon disappear, leaving a sensation of heat. The effect is due to the mechanical irritation of the hairs. This system of counter-irritation has, we are told, produced no inconvenience; children bear it easily. The indications for its employment are the same as for the use of tartar-emetic or croton-oil ointment.

M. Blatin believes cowhage ointment to be a good medium for the en-

dermic application of various substances, such as hydrochlorate of morphia. —*American Journ. Med. Sci.* from *Assoc. Med. Journ.* April 1, 1853.

Antiseptic properties of Iodoform; Inhalation of its Vapor in Phthisis.—Iodoform, according to RIGHINI (*Journ. de Chim. Méd.* Feb. 1853,) is possessed of remarkable antiseptic and antispasmodic properties. He tried it in a silk manufactory, by distributing vessels containing small quantities, either in powder or diffused in water, through different parts of the establishment; and he found it effectual, with the advantage, moreover, of not incommoding the work people. As a hygienic resource in hospitals, he recommends that it be employed in the following manner:—

A soft paste is made, by moderately heating sixteen parts of starch in a sufficient quantity of distilled water, and stirring them with a wooden spatula. Eight parts of iodoform having been added, the mixture will be found to be readily absorbed by filtering-paper. The paper prepared in this way is cut into strips three or four inches wide, and suspended in the wards. The iodoform slowly escapes without causing any inconvenience to the inmates. It is most freely liberated in moist states of the atmosphere. M. Righini recommends iodoform-paper for the purpose of obviating the bad smells and noxious effluvia of slaughter-houses, and also for preserving meat from spoiling.

M. Righini states that the inhalation of iodoform dissolved in ether is of great service in retarding the progress of phthisis.—*Ibid.*

Bitartrate of Magnesia.—The *Hanoverian Pharmacopœia* has the following formula for this salt, viz.:

Take of Tartaric acid - - -	125 grammes.
Distilled water - - -	2000 "
Dissolve and add gradually in portions,	
Carbonate of magnesia - -	157 grammes.
Evaporate and crystallize.	

Journ. de Chim. Méd.

Caffein.—The *Hanoverian Pharmacopœia* directs caffein to be made by precipitating a decoction of coffee with acetate of lead, filtering and washing the precipitate, evaporate the liquids to dryness and after mixing the powdered extract with sand, the mass is sublimed in a Mohr's apparatus just as in making benzoic acid.—*Journ. de Chem. Méd.*

Suppository of Belladonna.—The *Pharmacopœia* of Hanover directs a suppository to be made of

Extract of Belladonna - - -	10 grains.
Acetate of morphia - - - -	¾ of a grain.
Butter of cacao - - - -	1½ drachm.

Mixed and made into three suppositories. [*Journ. de Chim. Méd.*

Editorial Department.

Our Journal.—It was intended to leave open a form of this number, until after the meeting of the Association, so as to incorporate a short account of its proceedings, but the idea was abandoned in view of the detention of the Journal beyond the time it is due. This will, however, if possible, be compensated for by forwarding the November number somewhat earlier than usual. We have to apologize for the very long articles on the state of Pharmacy in England and Germany, which, to some, who take the Journal more for its practical items, may not be acceptable, yet in view of the great interest taken at this time, by many others, in the working of pharmaceutical institutions and measures, it has been thought best to publish the whole of the remainder of the interesting article of M. Bussy. The increase of our subscription list since the first of January has been gratifying, and indicates that the change then commenced in the size and appearance of the Journal, has not met with disapprobation. It shall be our endeavor to render the work as practical as possible. Its usefulness might be much increased, and its interest enhanced, if but a tythe of the pharmaceutists, who are qualified to make observation, and who are constantly in the way of doing it, would become occasional contributors of letters relative to the state of pharmacy—notices of adulterations—unusual phenomena in compounding prescriptions—incompatible prescriptions—the changes that officinal preparations undergo in warm latitudes—new remedies, etc. It is usual in the "London Pharmaceutical Journal" to devote a page to answering queries from correspondents, who usually adopt a *nom de guerre*—as *Amicus*, *Chemicus* or *Juvenis*—or simply initials. By this means, in a small space, much information interesting to the querists may be given. Now we propose to our readers to commence such an arrangement on the following conditions:—that the correspondent sends his proper name in addition to his anonymous signature, and that he prepays the postage of his note. Inquiries regarding books, preparations, phenomena, apparatus, etc., requiring but short answers, will be appropriate.

Meeting of the American Pharmaceutical Association.—By the time our readers receive this number the Association will have met on the 24th of August to carry out the objects of its institution. It is hoped that the meeting will be large. Various measures, important to the improvement of our art and the advancement of its practitioners as a professional body, will be brought forward, relating to the statistics and general condition of American Pharmacy, to the inspection of drugs, to pharmaceutical organization, to the discouragement of quackery, and to practical and scientific education. There is need of more *esprit du corps*—of a greater willingness to sacrifice personal interest for the benefit of the profession—among the druggists and apothecaries of the United States. Twelve years ago the chemists and druggists of England were in a hopelessly divided state—no organization existed—jealousy

was rife—nothing short of an attack on their rights or privileges as a body of tradesmen could induce any consociation or combined action; and as soon as the danger had passed, they separated, as though no common interest but security could assimilate them. Since the organization of the Pharmaceutical Society a complete change has come over the pharmacy of England and Scotland. The Society extends over the whole island; its members and associates to the number of more than 3000 are found in every city and town of note; local secretaries are dotted over the country and act as so many arms of the Society. The Monthly Journal is taken by every member for a part of his subscription, and hence all are kept apprized of the transactions of the parent society, and the progress of art and science. Branch associations are springing up, and the profession is rapidly attaining that unanimity of action and desire for improvement which always secures success. In this country we want a central power, but not as they have it in England. We want a national association of pharmaceutists constituted somewhat like our political union—of delegates from the incorporated colleges and societies, and of representatives from the pharmaceutists of places not under organization who shall come with the approval of their brethren, much as in the present constitution of the Association. The few local societies now existing do not form a basis sufficiently broad to support such a structure as is needed. These colleges and societies have their several spheres of action, in which their special usefulness is adapted to the circumstances that surround them. Let them go on increasing in number until every state or chief city is provided;—there cannot be too many. Meanwhile, let the National Association go on gaining strength and influence; its success interests all; all have or may have a part in its councils; and as it has no tendency to cumulation, no field of aggrandizement as a permanent property-holding society, there is no room for jealousy on the part of local corporations, and no grounds for fear of oppression on the part of the general profession. It is of the utmost importance that honesty, candor, and disinterestedness, should be prominent and true features of the present reformatory movement, to convince those who are to be the subject of its measures that the object is a pure one, unaccompanied by hidden motives for personal aggrandizement. Men are ever fallible; the best arranged schemes often fall short of the desired aim. The motives that induce men to engage in reforms are exceedingly various when carefully analyzed; yet, let us, while not expecting too much of human nature, hope that all these things will work together for good; and adopting for our motto the words of the great dramatist,

> "Our doubts are traitors,
> And make us lose the good we oft might win,
> By fearing to attempt,"

let us do the best with the power that we have, and under the circumstances that we find ourselves, and success will surely follow.

CARTHAGENA IPECACUANHA.—Through the kindness of Messrs. Haskell, Merrick & Bull, Druggists, of New York, we have received a fine specimen of so-called "Carthagena Ipecacuanha." This sample of the drug in its

general aspect belongs to the grey variety; a considerable number of the roots have more or less of the woody stems attached, and many of these stems are loosely admixed with the proper drug. The roots vary in thickness from one to two and a half lines, are more or less contorted, are less annulated and marked with fewer transverse fissures than the Brazilian, while the relation of the cortical to the ligneous portion is about the same. The color of the epidermis is a uniform dull gray; the fracture is smooth and has a resinous lustre and greyish-brown color; its odor is that of the ordinary variety, as also is its taste. From the greater percentage of ligneous stems it must be considered inferior in value to the best Brazilian root, but when properly garbled, we have no doubt that it will prove quite equal in efficacy. As regards its origin, it probably is brought from the interior. Dr. Wood says (U. S. Disp. page 414, 1851,) "We have seen in this market bales of gray ipecacuanha with very imperfectly developed rings, which was said to come from Caraccas. At present, however, this is very rare, if to be found at all."

According to Humboldt, ipecacuanha grows in New Grenada, and it is altogether probable that the variety in question is derived by a trans-montane commerce from the northern slope of the Valley of the Amazon, in the southern portion of New Grenada and northern Brazil drained by the Rio Negro.

New York Medical Gazette vs. Apothecaries.—We extract the following from the July number of the New York Medical Gazette:

"Mistakes of Apothecaries.—The fatal blunders by apothecaries or their clerks are becoming so numerous, that a due regard to the safety of human life imperatively demands the enactment of some stringent measures by law, for the protection of the public. The College of Pharmacy appears to be powerless, as it certainly is useless, as a remedy of the evil. Unless something is speedily done, it will be the duty of physicians to return to their former practice, now nearly obsolete, of supplying their patients with medicines, instead of allowing them to depend upon the casual apothecaries in the neighborhood, in many of which neither master nor man have any qualification for their business, and are as liable to give morphine instead of quinine, or as in a recent fatal instance, *laudanum for paregoric!* a mistake which admits of no palliation, and should subject the offender to exile from the trade forever.

There are a few educated, discreet, and careful apothecaries in the city, who neither themselves, nor by their clerks, presume to act the doctor, by changing or criticising the prescriptions sent to them, or expressing their sage opinions of the dose. Such and such only should be patronized by the profession or the public. We know of many shops, the impertinence of whose proprietors in this regard, will account for their being shunned by medical men, and avoided by their patients, the only redress which is available. It is full time that physicians and apothecaries should understand their relations to each other better, or change them for the safety of their patients."

We have read the above article with regret—not but that it may contain much truth, and that many of those who practice pharmacy in our sister city may be unqualified for their duty—a fact which applies unfortunately

not only to New York, but to this city and the whole country, and equally to the *medical* profession as to the pharmaceutical. It is to the spirit manifested by the writer that we object. He speaks as though medical men were exempt from liability to accidents, or were generally so well educated as to rarely make mistakes. *Without forgetting that "two wrongs don't make a right,"* we may state that in an experience of more than twenty years in the practice of extemporaneous pharmacy, serving a large range of practitioners, it has fallen to our lot to detect hundreds of errors in the prescriptions of *all grades* of physicians, made by the different causes of inadvertence, forgetfulness, ignorance and carelessness, and with a few rare exceptions our medical friends have acknowledged it as a kindness. We hold it to be the *duty* of the apothecary to invariably exercise his judgment in regard to the prescriptions brought to him; not whether the dose is proper for the disease, or even to make any enquiry about the case, but to satisfy himself that the substances prescribed are such as the doctor intended, and the dose not a poisonous one; that he may in this way detect errors and save the patient, as well as the reputation of the physician. He should not excite suspicion in the messenger that something is wrong, or interfere in any way hurtful to the physician, but quietly to refer the prescription to him for his revision, whilst the messenger is desired to return and the medicine will be sent when ready. In Germany, the best regulated country as regards pharmacy, it is the apothecary's duty to thus refer the prescription, and then if it is reordered to be put up, he is exonerated from all blame.

As regards the last sentence of the writer, it may be well to say, that the practice of pharmacy by medical men in cities where qualified apothecaries exist, is a fruitful source of the very difficulty he complains of. In this city there are about forty of such stores, some of which are left in the hands of boys and ill-qualified assistants during the absence of their proprietors on medical duty. Besides, from motives of competition, the proprietors of neighboring stores, who do not take a stand against indiscriminate counter-practice, are induced to *doctor* their customers *gratis* to get custom. If the *unrecorded* annals of the physician's office in times long past, when the practical duties fell chiefly to the office student, could be explored, some curious and tragical details would be brought to light; and in the absence of the *check* arising from the distinct functions of two professions, it is altogether probable that not a few fatal results of carelessness or ignorance have quietly passed to the account of the virulence of disease, uncommented and unknown. Country practitioners will probably always have to continue the troublesome practice of supplying their patients with medicines—circumstances render it necessary—but it is greatly to be hoped that in cities and towns a broad line of demarcation should be drawn between pharmacy and medicine as one of the best means of raising the standing of the practitioners of both.

New York Journal of Pharmacy.—For some reason unknown, our pharmaceutical cotemporary has not been received since March or April

last, and we have been dependent on a friend for a sight of its countenance. We appreciate its friendly visits too well to be satisfied with their discontinuance, and trust that we shall soon be favored with their continued return. Our country is large enough for both, and there is labor sufficient for half a dozen.

WORKS OF THE CAVENDISH SOCIETY FOR 1852.

HAND BOOK OF CHEMISTRY. By LEOPOLD GMELIN. Vol. VII. *Organic Chemistry*, vol. I. *Generalities of Organic Chemistry. Organic Compounds containing two atoms of Carbon.* Translated by HENRY WATTS, B. A., F. C. S. London, 1852. pp. 501, 8vo.

PHYSIOLOGICAL CHEMISTRY. By PROFESSOR C. G. LEHMANN. Vol. II. Translated by GEORGE E. DAY, M. D., F. R. S., &c. London, 1853. pp. 465, 8vo.

ATLAS OF PHYSIOLOGICAL CHEMISTRY. *Consisting of Microscopic Figures.* By DR. OTTO FUNKE. *Being a Supplement to Lehmann's Physiological Chemistry.* London, 1853.

The books above enumerated constitute the issue of the Cavendish Society of London for the year 1852. The advantages offered by this Society, to the chemical student, are made apparent by the fact, that these three works, which probably, in the ordinary course of publication, would never have been put forth in English, are being presented under the auspices of the Society, all expenses paid, at less than two dollars a volume.

We have neither the time nor the space to notice these works as they deserve. The seventh volume of the "Handbuch" is the first of the six volumes that will embrace the department of organic chemistry. Nearly one half of it is devoted to the generalities of organic chemistry—namely: To the constitution, formation, properties, and classification, of organic compounds; together with nomenclatural suggestions, and a general view of the theory of types. The remainder treats of "Compounds containing two atoms of carbon," the "Methylene series."

The author adopts the nucleus theory, in explaining the constitution of compounds, and he considers that it, "when properly carried out, arranges organic compounds in a natural order, which is as easy of comprehension as the extraordinary variety of the compounds will admit." It has so happened, since the German edition of this volume was published, that several remarkable discoveries have been made, which uphold the Binary radical theory of Berzelius, Liebig and others; and which remove some of the arguments used negatively in favor of the nucleus theory of Laurent, as, for instance, the *non-isolability* of the organic acids and the alcohol radicals, both of which have been accomplished in several instances. In glancing over this work, one is struck with the immense accumulation of observations which chemists have heaped together within the last twenty years. With all the ingenuity of Berzelius, Dumas, Laurent, Liebig, Lowig, Gmelin and others, the simplest arrangement they can make presents so many complexities and anomalies, and requires so much hypo-

thesis, that the whole subject must be looked upon as in a transition state. Meanwhile, facts will be accumulating, and new laws will be developed, until some mighty mind, like Lavoisier or Berzelius in the past, suited to the work, seizes on the simple, fundamental truths, (which are at the basis of all natural arrangements) and give order and consistency to the whole mass.

It is perfectly appalling to a beginner to take up such a work as Gmelin's, and look through the long columns of complex combinations which the few elements of organic matter are capable of constituting; yet, viewed as a magazine of facts—as a cyclopedia of all that is known in chemistry, the "Handbuch" is a glorious monument to the industry and genius of the author, and a boon of great value to *all* classes of chemists, and to pharmaceutists, who frequently have occasion to refer to chemical authorities, even when possessing few claims to the name of chemists themselves.

The Physiological Chemistry of Lehmann is the second of the three volumes. (See vol. xxiv. p. 286, for a notice of the 1st volume.) The second and last part is not yet translated, but will probably appear in the course of the present or early in the next year. This volume is occupied in the description and discussion of the animal juices, including the saliva, gastric juice, bile, pancreatic juice, intestinal juices and contents, the blood, chyle, lymph, milk, seminal fluid, fluid of the egg, mucus, cutaneous secretions, and urine.

In the treatment of his subject the author has aimed as far as possible to confine himself to the known—to facts—as recorded by the most reliable observers. He repudiates the strong tendency to build bold and comprehensive theories on a few results, that even themselves will oftentimes not bear the test of repetition, and the deductions from which are mere chimeras. He remarks, (page 9,) "If ever we cherished the hope of combining the results of former inquiries in one scientific whole, constituting a purely inductive branch of science, in accordance with our view of the method in which physiological chemistry, and more especially the theory of the animal juices, should be treated, our courage would fail, as indeed it often has done, when we attempted the accomplishment of such a task. We believe that, in the first volume, we have already sufficiently explained our view of the very great deficiency of our knowledge in this deparment of the physical sciences, but there is less a want of positive knowledge than a redundancy of materials, that render it a matter of almost insurmountable difficulty to demonstrate with clearness the pure and unadulterated character of science free from pretentious delusions. We confess that we have therefore abstained from attempting in the following pages to give the whole mass of the results that have been obtained within this department of science from all experiments and observations, whether good or bad; limiting ourselves to facts collected by the best observers, which, as far as our powers and exper ence permitted, we have compared with the results of our own observations, testing the different conclusions and hypotheses by a course of logical inquiry."

We have only space for a few further extracts from the chapter on gastric juice:

"Gastric Juice.—The fluid which accumulates in the stomach after the

ingestion of food, is in its pure state perfectly clear and transparent, almost entirely devoid of color, having at most but a very faint yellow tint; it has a very faint, peculiar odor, and a scarcely perceptible saline-acid taste, and is a little heavier than water. Only a few morphological elements can be perceived in it; and these consist partly of unchanged cells of the gastric glands, partly of the nuclei of these cells, and partly of a fine molecular matter which is produced by the disintegration of these elements. Its reaction is very acid; it is not rendered turbid by boiling; when neutralized with alkalies a slight turbidity may sometimes be remarked. The gastric juice is distinguished from most other animal fluids by the circumstance that it remains for a very long time undecomposed, and that even when a fungus growth (mould) has appeared, it always still retains its most essential character, namely, its digestive power.

"The best method of obtaining gastric juice in a state of the greatest possible purity, is to feed dogs, in whom gastric fistulæ have been artificially formed, with bones which they can readily break to pieces; in the course of from five to ten minutes to open the outer closed extremity of the fistula; and by means of a funnel and catheter to collect the escaping juice, and to separate it by filtration from flocculi of mucus, and any fragments of food that may be present. It is, however, an objection that a considerable quantity of saliva is always mixed with the gastric juice obtained in this manner."

"After Eberle had shown that the gastric juice, when removed from the animal body, retains the property of inducing peculiar changes in the food, and that by digesting the mucus membrane of the stomach with extremely dilute acids, we obtain a fluid which possesses true digestive powers, it was proved by Schwann that it is only the glandular structure of the stomach which possesses the property of yielding a digestive mixture with acids; and further, that corrosive sublimate throws down a precipitate from it which possesses the digestive power in a high degree. To this substance Schwann gave the name of *pepsin*. Wasmann, who investigated the subject even more fully than Schwann, demonstrated that the source of the gastric juice and of this pepsin lay in the gastric glands, which he carefully observed and described; he likewise attempted to exhibit pepsin in a purer state.

"He proceeded in the following manner: The glandular layer in the stomach of the pig, which extends chiefly from the greater curvature through the cardia, was carefully detached and washed, without being cut up; then digested with distilled water, at a temperature of from 30° to 35° F. After some hours, the fluid was poured away, the membrane was again washed in cold water, and then digested in the cold with about six ounces of distilled water, and repeatedly washed, till a putrid odor began to be developed. The filtered fluid was transparent, viscid, and without any reaction; it was now precipitated with acetate of lead or corrosive sublimate; the precipitate was carefully washed and decomposed with sulphuretted hydrogen; the pepsin was then precipitated by alcohol from the watery solution, in white flocks."

"The pepsin thus obtained, forms, when dry, a yellow, gummy, slightly hygroscopic mass; in its moist state it is white and bulky; it dissolves readily in water, and always retains a little free acid, so as to redden litmus; it is precipitated by alcohol from its watery solution; mineral acids induce a turbidity in a solution of neutralized pepsin, which disappears on the addition of a small excess of the acid; but if there be a considerable excess of the acid, there is a flocculent deposit; it is only imperfectly precipitated by metallic salts, and not at all by ferrocyanide of potassium; it has been asserted that pepsin is coagulated by boiling, but Frerichs has shown that the coagulation is merely dependent on its admixture with albumen.

"This substance possesses the converting property in so high a degree, that, according to Wasmann, a solution containing only one sixty-thou-

sandth part, if slightly acidulated, dissolves coagulated albumen in six or eight hours. This property of pepsin is not destroyed by alcohol; and in this respect Wasmann and Schwann coincide; it is, however, lost when the solution is boiled, or carefully neutralized with potash; in both cases the fluid becomes turbid."

"We are as yet unable to make any decisive statement regarding the quantity of gastric juice secreted in 24 hours; indeed, on this point, we are at present entirely devoid of data; we only know that, in the healthy state, its secretion is entirely dependent on the ingestion of food, and that some articles of diet excite a more copious secretion of gastric juice than others. Thus, for instance, sugar, aromatic substances, spirit of wine, and alkalies, when introduced into the stomach, immediately excite an almost overflowing secretion of gastric juice; while, on the other hand, animal substances, which remain for a longer period in the stomach, require a far greater quantity of gastric juice for their perfect conversion.

"According to my experiments, 100 grammes of the fresh gastric juice of a dog cannot, on an average, effect the solution of more than five grammes of coagulated albumen, (calculated as dry.) Now, if we assume that an adult man receives into the stomach about 100 grammes of albuminous matter in 24 hours, there must be secreted 2000 grammes, or 4 pounds of gastric juice for the digestion of this quantity."

The work of Dr. Funke is viewed as a supplement to Lehmann's work; it consists of a series of fifteen plates, each presenting six microscopic views of substances, crystalline and amorphous, of the animal organism. Among the more prominent may be mentioned oxalate of lime, butyric acid salts, lactates, creatin and creatinin, taurin, glycine, hippuric acid, uric acid, cholic acid, cholestearin, vessels filled with chyle in the villi of the small intestines, liver cells, blood corpuscles under various conditions, blood crystals, milk, urinary deposits under different pathological conditions, muscular fibre and nervous fibre. The engravings are executed in Germany, from the original plates, and colored there, specially for the Cavendish Society, so that there has been nothing of their original excellence and accuracy lost by copying. The author observes, "the task which I have undertaken is the graphic representation of all those substances where microscopic and micro-chemical investigation is of importance to physiological chemistry, comprehending in this term all that has received the sanction of Lehmann's work—that is, excluding special phyto-chemistry, and including, so-called, pathological chemistry, which it is altogether impossible to separate from purely physiological chemistry." It has been the object of the author to reproduce the natural objects in the minutest detail, conscientiously "prohibiting the slightest idealization, either by myself or the lithographer." All the drawings are original, and as mathematically exact as it was possible to get them, both as regards angles, and outlines, and proportions. The drawings were executed by aid of one of Oberhauser's large microscopes, and the author preferred to employ, in most instances, one of the lower powers, between 180 and 200 fold, as being better adapted for the use of students, and consequently that the drawings would, from that cause, better correspond with the practical observations of the microscopic student. Although not properly qualified to give an opinion in the matter, yet we cannot refrain from expressing our unqualified satisfaction with the beautiful and accurate delineations which the plates present, and which must prove of essential service to the student of physiological chemistry.